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Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site K (Data Supplement)

KVB, Inc.
Minneapolis, MN

Prepared for

Industrial Environmental Research Lab.
Research Triangle Park, NC

May 80

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1500 Wilson Boulevard
Arlington VA 22209

DoE United States Department of Energy
Division of Power Systems
Energy Technology Branch
Washington DC 20545

EPA United States Environmental Protection Agency
Industrial Environmental Research Laboratory
Research Triangle Park NC 27711

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May 1980

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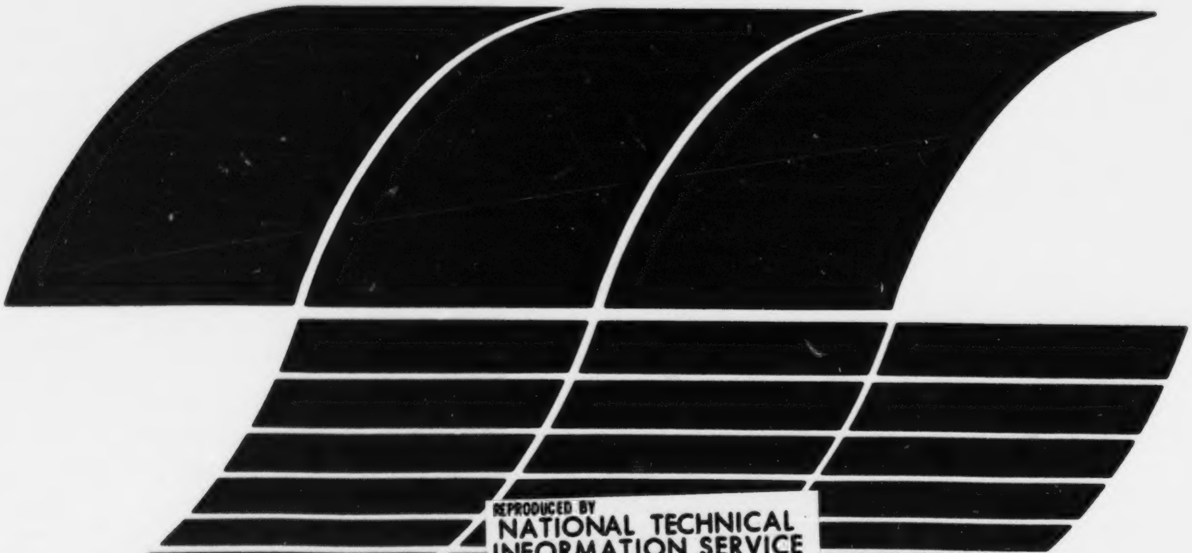
Interagency Energy/Environment R&D Program Report



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Combustion	Flue Gases	Combustion Modification	21B	
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Program Element No. EHE624

Project Officers: R. Hall (EPA) and W. Harvey, Jr. (DoE)

Industrial Environmental Research Laboratory
Office of Environmental Engineering and Technology
Research Triangle Park, NC 27711

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Division of Power Systems/Energy Technology Branch
Washington, DC 20545

and

AMERICAN BOILER MANUFACTURERS ASSOCIATION
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i.a

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Foreword

The purpose of this Data Supplement Volume is to document data in greater detail than was practical in the Final Technical Report.[1] It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume.

The data in this volume are arranged by type (i.e., Panel Board Data, Particulate Data, etc.) and within each type by test number. Data summaries where they exist are at the front of each section. The boiler tested is referred to as Boiler K; as it is the eleventh boiler tested under the program entitled, "A Testing Program to Update Equipment Specifications and Design Criteria for Stoker Fired Boilers."

KVB 4-15900-548

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[1] Langsjoen, P. L., et al., "Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site K."

CONVERSION FACTORS

ENGLISH AND METRIC UNITS TO SI UNITS

To Convert From	To	Multiply By
in	cm	2.540
in^2	cm^2	6.452
ft	m	0.3048
ft^2	m^2	0.09290
ft^3	m^3	0.02832
lb	Kg	0.4536
lb/hr	Mg/s	0.1260
$lb/10^6BTU$	ng/J	430
g/Mcal	ng/J	239
BTU	J	1054
BTU/lb	J/kg	2324
BTU/hr	W	0.2929
J/sec	W	1.000
J/hr	W	3600
BTU/ft/hr	W/m	0.9609
BTU/ft/hr	J/hr/m	3459
$BTU/ft^2/hr$	W/m^2	3.152
$BTU/ft^2/hr$	$J/hr/m^2$	11349
$BTU/ft^3/hr$	W/m^3	10.34
$BTU/ft^3/hr$	$J/hr/m^3$	37234
psia	Pa	6895
"H_2O	Pa	249.1
Rankine	Celsius	C = 5/9R-273
Fahrenheit	Celsius	C = 5/9(F-32)
Celsius	Kelvin	K = C+273
Rankine	Kelvin	K = 5/9R

FOR TYPICAL COAL FUEL

ppm @ 3% O_2 (SO_2)	ng/J ($lb/10^6Btu$)	0.851 (1.98×10^{-3})
ppm @ 3% O_2 (SO_3)	ng/J ($lb/10^6Btu$)	1.063 (2.47×10^{-3})
ppm @ 3% O_2 (NO)*	ng/J ($lb/10^6Btu$)	0.399 (9.28×10^{-4})
ppm @ 3% O_2 (NO_2)	ng/J ($lb/10^6Btu$)	0.611 (1.42×10^{-3})
ppm @ 3% O_2 (CO)	ng/J ($lb/10^6Btu$)	0.372 (8.65×10^{-4})
ppm @ 3% O_2 (CH_4)	ng/J ($lb/10^6Btu$)	0.213 (4.95×10^{-4})
g/kg of fuel**		

*Federal environmental regulations express NOx in terms of NO_2; thus NO units should be converted using the NO_2 conversion factor.

** Based on higher heating value of 10,000 Btu/lb. For a heating value other than 10,000 Btu/lb, multiply the conversion factor by 10,000/(Btu/lb).

CONVERSION FACTORS

SI UNITS TO ENGLISH AND METRIC UNITS

To Convert From	To	Multiply By
cm	in	0.3937
cm^2	in^2	0.1550
m	ft	3.281
m^2	ft^2	10.764
m^3	ft^3	35.315
Kg	lb	2.205
Mg/s	lb/hr	7.937
ng/J	$lb/10^6BTU$	0.00233
ng/J	g/Mcal	0.00418
J	BTU	0.000948
J/kg	BTU/lb	0.000430
J/hr/m	BTU/ft/hr	0.000289
$J/hr/m^2$	$BTU/ft^2/hr$	0.0000881
$J/hr/m^3$	$BTU/ft^3/hr$	0.0000269
W	BTU/hr	3.414
W	J/hr	0.000278
W/m	BTU/ft/hr	1.041
W/m^2	$BTU/ft^2/hr$	0.317
W/m^3	$BTU/ft^3/hr$	0.0967
Pa	psia	0.000145
Pa	"H_2O	0.004014
Kelvin	Fahrenheit	F = 1.8K-460
Celsius	Fahrenheit	F = 1.8C+32
Fahrenheit	Rankine	R = F+460
Kelvin	Rankine	R = 1.8K

FOR TYPICAL COAL FUEL

ng/J	ppm @ 3% O_2 (SO_2)	1.18
ng/J	ppm @ 3% O_2 (SO_3)	0.941
ng/J	ppm @ 3% O_2 (NO)	2.51
ng/J	ppm @ 3% O_2 (NO_2)	1.64
ng/J	ppm @ 3% O_2 (CO)	2.69
ng/J	ppm @ 3% O_2 (CH_4)	4.69
ng/J	g/kg of fuel	0.000233

SI PREFIXES

Multiplication Factor	Prefix	SI Symbol
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto*	h
10^{1}	deka*	da
10^{-1}	deci*	d
10^{-2}	centi*	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

*Not recommended but occasionally used

EMISSION UNITS CONVERSION FACTORS FOR TYPICAL COAL FUEL (HV = 13,1320 BTU/LB)

To Obtain		% Weight in Fuel		$lbs/10^6Btu$		$grams/10^6Cal$		PPM (Dry @ 3% O_2)		Grains/SCF. (Dry @ 12% CO_2)	
Multiply By		S	N	SO_2	NO_2	SO_2	NO_2	SOx	NOx	SO_2	NO_2
% Weight In Fuel	S	1		0.666		0.370		13.2×10^{-4}		1.48	
	N				0.405		0.225		5.76×10^{-4}		.903
$lbs/10^6Btu$	SO_2	1.50		1		(.556)		19.8×10^{-4}		(2.23)	
	NO_2		2.47				(.556)		14.2×10^{-4}		(2.23)
$grams/10^6Cal$	SO_2	2.70		(1.8)		1		35.6×10^{-4}		(4.01)	
	NO_2		4.44		(1.8)				25.6×10^{-4}		(4.01)
PPM (Dry @ 3% O_2)	SOx	758		505		281		1		1127	
	NOx		1736		704		391				1566
Grains/SCF (Dry @ 12% CO_2)	SO_2	.676		(.448)		(.249)		8.87×10^{-4}		1	
	NO_2		1.11		(.448)		(.249)		6.39×10^{-4}		

NOTE:
1. Values in parenthesis can be used for all flue gas constituents such as oxides of carbon, oxides of nitrogen, oxides of sulfur, hydrocarbons, particulates, etc.
2. Standard reference temperature of 530°R was used.

SECTION 1.0

PANEL BOARD DATA

PAGE

1.1 CONTROL ROOM DATA SHEETS 2

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PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 48,708
Coal Flow, lb/hr 4869
Evaporation, lb stm/lb coal 10.0
% Steam Capacity 97.4

TEST NO.	1	1	1	1	1
TEST DATE	10-11-79				
TEST COAL	Brilliant	Coal Company		Brilliant	Alabama
TEST CONDITIONS	max load	50,000 lbs/hr			
COAL					
COAL SCALE COUNTER	21994		22018		22043
TIME OF READING	1230		1327		1429
STEAM					
INTEGRATOR READING	118108		118207		118306
TIME OF READING	12:27		13:29		14:27
CHART RECORDER					
STEAM FLOW, LB/HR	47	50	50	50	47
FEEDWATER PRESSURE, PSIG	145	155	157	157	145
F.D. AIR (RELATIVE)	90	95	95	100	100
BOILER DRUM LEVEL	+1.0	+1.0	+1.0	+1.0	+1.0
ECON IN GAS TEMP °F	480	510	510	510	510
ECON OUT GAS TEMP °F	380	395	400	397	400
FEEDWATER ECON IN TEMP, °F	255	255	255	255	255
FEEDWATER ECON OUT TEMP, °F	305	305	305	310	310
BOILER STEAM PRESSURE, PSIG	131	134	133	132	132
Visual	0-10%		0-10%		0-10%
SMOKE DENSITY 0-100%	005				

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PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr______________
Coal Flow, lb/hr______________
Evaporation, lb stm/lb coal______________
% Steam Capacity______________

TEST NO.	1				
TEST DATE	10-11-79				
TEST COAL	Brilliant	Alabama			
TEST CONDITIONS	max load				
COAL					
COAL SCALE COUNTER		22065			
TIME OF READING		15:25			
STEAM					
INTEGRATOR READING	118357	118397			
TIME OF READING	14:29	15:25			
CHART RECORDER					
STEAM FLOW, LB/HR	45	49			
FEEDWATER PRESSURE, PSIG	150	155			
F.D. AIR (RELATIVE)	88	90			
ECON IN GAS TEMP °F	510	510			
ECON OUT GAS TEMP °F	400	400			
FEEDWATER ECON IN TEMP, °F	255	255			
FEEDWATER ECON OUT TEMP, °F	310	310			
BOILER STEAM PRESSURE, PSIG	131	134			
SMOKE DENSITY 0-100%	0-10%				

TEST NO.		1				
DRAFT GAUGES						
WINDBOX	"H_2O	+.80	+1.1	+1.7	1.7	1.7
OFA	"H_2O	+.25	+.25	+2.5	2.5	2.5
FURNACE DRAFT	"H_2O	-.20	-.20	-.15	-.12	-.15
BOILER OUT	"H_2O	-.5	-.8	-.8	-.8	-.8
ECON OUT	"H_2O	-2.1	-3.0	-7.0	-3.0	-3.1
DUST COLLECTOR OUT	"H_2O	-4.8	-7.2	-7.4	-7.5	-7.5
STOKER COMP						
1	"H_2O	.15	.30	.27	.35	.35
2	"H_2O	.50	1.0	.97	1.03	1.15
3	"H_2O	.46	1.0	.94	1.10	1.10
4	"H_2O	.40	.84	.85	1.05	1.02
5	"H_2O	.08	.28	.24	.35	.30
6	"H_2O	0	0	0	0	0
CONTROLS						
BOILER RATING			100		100	
STOKER CONTROL			35		35	
OFA RATIO			31		31	
STEAM/AIR RATIO			83		83	
I.D. FAN DAMPER CONTROL			35		35	
BOILER MASTER			42		42	
FUEL RATIO			90		90	
OFA CONTROL			23		22	
F.D. FAN CONTROL			52		52	
COAL GATE POSITION			4.7/4.5		4.7/4.5	

TEST NO.		1				
DRAFT GAUGES						
WINDBOX	"H_2O	+1.4				
OFA	"H_2O	+2.5				
FURNACE DRAFT	"H_2O	-.20				
BOILER OUT	"H_2O	-.8				
ECON OUT	"H_2O	-2.7				
DUST COLLECTOR OUT	"H_2O	-6.5				
STOKER COMP						
1	"H_2O	.20				
2	"H_2O	.70				
3	"H_2O	.70				
4	"H_2O	.68				
5	"H_2O	.16				
6	"H_2O	0				
CONTROLS						
BOILER RATING		100				
STOKER CONTROL		35				
OFA RATIO		32				
STEAM/AIR RATIO		83				
I.D. FAN DAMPER CONTROL		35				
BOILER MASTER		42				
FUEL RATIO		91				
OFA CONTROL		25				
F.D. FAN CONTROL		52				
COAL GATE POSITION		4.7/4.5				

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NOTES

TEST NO: 1	BOILER WENT POSITIVE WHEN DRAFT READ -0.1
	BEFORE START OF TEST
TEST NO:	
TEST NO:	
TEST NO:	
TEST NO:	

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PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 24,968
Coal Flow, lb/hr 2480
Evaporation, lb stm/lb coal 10.1
% Steam Capacity 49.9

TEST NO.	2	2	Z		
TEST DATE	10-13	10/13	—		
TEST COAL	Brilliant;	Alabama -	washed		
TEST CONDITIONS	baseline	—			
COAL					
COAL SCALE COUNTER 200#/dump	22668	22681	22693	22699	
TIME OF READING	10:07	11:06	12:05	12:37	
STEAM					
INTEGRATOR READING x500 lb/hr	120823	120876	120926	120953	
TIME OF READING	9:54	10:56	11:55	12:29	
CHART RECORDER					
STEAM FLOW, LB/HR	260	250	250	225	
FEEDWATER PRESSURE, PSIG	325	325	325	280	
F.D. AIR (RELATIVE)	80%	73%	70%	72%	
Boiler Drum Level	0.2	0.2	0.2	0.2	
ECON IN GAS TEMP °F	450	450	435	435	
ECON OUT GAS TEMP °F	365	365	360	365	
FEEDWATER ECON IN TEMP, °F	268	268	285	285	
FEEDWATER ECON OUT TEMP, °F	324	324	320	320	
BOILER STEAM PRESSURE, PSIG	125	124	124	124	
SMOKE DENSITY 0-100%	5%	5%	5%	5%	

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TEST NO.		2				
DRAFT GAUGES						
WINDBOX	"H_2O	0.8	1.0	0.75	.75	
OFA	"H_2O	1.5	1.5	2.0	2.5	
FURNACE DRAFT	"H_2O	-.24	-.26	-.25	-.23	
BOILER OUT	"H_2O	-0.6	-0.7	-0.6	-.60	
ECON OUT	"H_2O	-2.1	-2.2	-2.0	-1.9	
DUST COLLECTOR OUT	"H_2O	-5.0	-5.3	-4.7	-4.6	
STOKER COMP						
1	"H_2O	0.00	0.04	0.05	0.03	
2	"H_2O	0.30	0.32	0.36	0.39	
3	"H_2O	0.38	0.40	0.44	0.47	
4	"H_2O	0.33	0.32	0.38	0.41	
5	"H_2O	0.00	0.00	0.00	0.04	
6	"H_2O	0.00	0.00	0.00	0.00	
CONTROLS						
BOILER RATING		100	100	100	100	
STOKER CONTROL		48	47	48	44	
OFA RATIO		33	33	33	33	
STEAM/AIR RATIO		95	95	91	102	
I.D. FAN DAMPER CONTROL		36	35	34	36	
BOILER MASTER		56	53	55	50	
FUEL RATIO		90	90	90	90	
OFA CONTROL		20	18	20	18	
F.D. FAN CONTROL		53	50	52	50	
COAL GATE POSITION		4.3/4.3	4.3/4.3	4.3/4.3	4.3/4.3	

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PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 35,593
Coal Flow, lb/hr 3630
Evaporation, lb stm/lb coal 9.8
% Steam Capacity 74%

TEST NO.	3	3	3		
TEST DATE	10/15	10/15	10/15		
TEST COAL	Brilliant - Alabama Washed				
TEST CONDITIONS	Baseline				
COAL					
COAL SCALE COUNTER	23331	23349	23367		
TIME OF READING	11:48	12:46	1:47		
STEAM					
INTEGRATOR READING X500 lb/hr	123471	123542	123611		
TIME OF READING	11:36	12:34	1:34		
CHART RECORDER					
STEAM FLOW, LB/HR	370	375	365		
FEEDWATER PRESSURE, PSIG	337	337	337		
F.D. AIR (RELATIVE)	75%	75%	80%		
Boiler Drum Level	0.8	0.8	1.0		
ECON IN GAS TEMP °F	470	480	475		
ECON OUT GAS TEMP °F	385	385	380		
FEEDWATER ECON IN TEMP, °F	260	260	262		
FEEDWATER ECON OUT TEMP, °F	310	310	315		
BOILER STEAM PRESSURE, PSIG	128	128	129		
SMOKE DENSITY 0-100%					

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TEST NO.		3	3	3		
DRAFT GAUGES						
WINDBOX	"H_2O	0.8	0.9	0.96		
OFA	"H_2O	2.1	2.2	2.26		
FURNACE DRAFT	"H_2O	-0.16	- 0.16	- 0.17		
BOILER OUT	"H_2O	- 0.65	- 0.60	- 0.70		
ECON OUT	"H_2O	- 2.15	- 2.2	- 2.30		
DUST COLLECTOR OUT	"H_2O	- 5.10	- 5.20	-5.20		
STOKER COMP						
1	"H_2O	0.04	0.06	0.08		
2	"H_2O	0.42	0.35	0.38		
3	"H_2O	0.45	0.39	0.43		
4	"H_2O	0.44	0.33	0.36		
5	"H_2O	0.00	0.00	0.00		
6	"H_2O	0.00	0.00	0.00		
CONTROLS						
BOILER RATING		102	102	102		
STOKER CONTROL		60	54	54		
OFA RATIO		33	33	33		
STEAM/AIR RATIO		85	85	85		
I.D. FAN DAMPER CONTROL		40	38	40		
BOILER MASTER		68	60	60		
FUEL RATIO		90	90	90		
OFA CONTROL		24	22	22		
F.D. FAN CONTROL		58	50	50		
COAL GATE POSITION		4.1 | 4.0	4.1 | 4.0	4.1 | 4.0		
		L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 49,750

Coal Flow, lb/hr 4,900

Evaporation, lb stm/lb coal 10.15

% Steam Capacity 99.5 %

TEST NO.	4	4	4		
TEST DATE	10/16	10/16	10/16		
TEST COAL	Brilliant	-Alabama	Washed		
TEST CONDITIONS	Baseline	⟶	⟶	Hi O2	
COAL					
COAL SCALE COUNTER x 200 #/dump	23740	23762	23789		
TIME OF READING	11:18	12:13	1:18		
STEAM					
INTEGRATOR READING x 500 #/hr	125102	125201	125301		
TIME OF READING	11:06	12:06	1:06		
CHART RECORDER					
STEAM FLOW, LB/HR	48.5	49.0	50.0		
FEEDWATER PRESSURE, PSIG	280	350	340		
F.D. AIR (RELATIVE)	95%	95%	82%		
Steam Drum Level	+1.5	+1.3	+1.2		
ECON IN GAS TEMP °F	515	515	515		
ECON OUT GAS TEMP °F	395	400	400		
FEEDWATER ECON IN TEMP, °F	260	255	255		
FEEDWATER ECON OUT TEMP, °F	310	307	300		
BOILER STEAM PRESSURE, PSIG	134	133	133		
SMOKE DENSITY 0-100%	5%	5%	5%		

TEST NO.		4	4	4		
DRAFT GAUGES						
WINDBOX	"H_2O	0.80	1.30	0.90		
OFA	"H_2O	2.50	2.50	2.50		
FURNACE DRAFT	"H_2O	-0.23	-0.18	-0.20		
BOILER OUT	"H_2O	-0.80	-1.00	-0.85		
ECON OUT	"H_2O	-2.40	-3.35	-2.80		
DUST COLLECTOR OUT	"H_2O	-5.60	-7.60	-6.70		
STOKER COMP						
1	"H_2O	0.03	0.02	0.07		
2	"H_2O	0.38	0.35	0.44		
3	"H_2O	0.42	0.38	0.48		
4	"H_2O	0.34	0.33	0.40		
5	"H_2O	0.06	0.05	0.08		
6	"H_2O	0.00	0.00	0.00		
CONTROLS						
BOILER RATING		100	100	100		
STOKER CONTROL		68	64	68		
OFA RATIO		33	33	33		
STEAM/AIR RATIO		80	80	80		
I.D. FAN DAMPER CONTROL		36	37	38		
BOILER MASTER		72	67	70		
FUEL RATIO		75	95	98		
OFA CONTROL		25	24	25		
F.D. FAN CONTROL		55	53	55		
COAL GATE POSITION		4 2 | 4.2	4.2 | 4 2	4.2 | 4 2		
		L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 47750
Coal Flow, lb/hr 4600
Evaporation, lb stm/lb coal 10.38
% Steam Capacity 95.5

TEST NO.	5	5	5		
TEST DATE	10/24	10/24	10/24		
TEST COAL	Brilliant - Alabama Washed (not crushed)				
TEST CONDITIONS	Full load (50,000 #/hr) Lo O_2				
COAL					
COAL SCALE COUNTER 200 #/dump	24829	24851	24875		
TIME OF READING	10:25	11:23	12:25		
STEAM					
INTEGRATOR READING × 500 #/hr	130074	130172	130265		
TIME OF READING	10:15	11:15	12:15		
CHART RECORDER					
STEAM FLOW, LB/HR	47.5	46.0	46.0		
FEEDWATER PRESSURE, PSIG	350	345	350		
F.D. AIR (RELATIVE)	72%	70%	75%		
Steam Drum Level	1.5	1.5	1.5%		
ECON IN GAS TEMP °F	510	520	520		
ECON OUT GAS TEMP °F	395	390	395		
FEEDWATER ECON IN TEMP, °F	260	260	260		
FEEDWATER ECON OUT TEMP, °F	305	304	305		
BOILER STEAM PRESSURE, PSIG	131	131	132		
SMOKE DENSITY 0-100%	10%	10%	10%		

KVB

TEST NO.		5	5	5		
DRAFT GAUGES						
WINDBOX	"H_2O	0.80	0.60	0.60		
OFA	"H_2O	2.60	2.60	2.60		
FURNACE DRAFT	"H_2O	-0.23	0.21	0.21		
BOILER OUT	"H_2O	-1.00	0.80	0.90		
ECON OUT	"H_2O	-3.10	2.50	2.90		
DUST COLLECTOR OUT	"H_2O	-7.00	6.00	6.70		
STOKER COMP						
1	"H_2O	0.00	0.01	0.00		
2	"H_2O	0.23	0.34	0.27		
3	"H_2O	0.25	0.39	0.31		
4	"H_2O	0.23	0.40	0.30		
5	"H_2O	0.14	0.26	0.14		
6	"H_2O	0.00	0.00	0.00		
CONTROLS						
BOILER RATING		102	102	102		
STOKER CONTROL		74	80	72		
OFA RATIO	20-25	55	55	55		
STEAM/AIR RATIO		64	60	60		
I.D. FAN DAMPER CONTROL		36	36	37		
BOILER MASTER		89	93	84		
FUEL RATIO		90	90	90		
OFA CONTROL		48	50	45		
F.D. FAN CONTROL		55	58	53		
COAL GATE POSITION		3.8 | 3.8	3.8 | 3.8	3.8 | 38		
		L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 47,454
Coal Flow, lb/hr 4,700
Evaporation, lb stm/lb coal 10.1
% Steam Capacity 94.9%

TEST NO.	6	6	6		
TEST DATE	10/24	10/24	10/24		
TEST COAL	Brilliant - Alabama Washed (not crushed)				
TEST CONDITIONS	Full Load (50,000 #/hr) 7.5 in. H_2O O.F.A.				
COAL					
COAL SCALE COUNTER X 200#/dump	24905	24929	24952		
TIME OF READING	1:40	2:40	3:40		
STEAM					
INTEGRATOR READING X 500	130385	130478	130559		
TIME OF READING	1:30	2:29	3:20		
CHART RECORDER					
STEAM FLOW, LB/HR	46.0	47.0	47.5		
FEEDWATER PRESSURE, PSIG	350	340	345		
F.D. AIR (RELATIVE)	82%	80%	85%		
Steam Drum Level	1.6	1.5	1.5		
ECON IN GAS TEMP °F	525	525	525		
ECON OUT GAS TEMP °F	405	405	405		
FEEDWATER ECON IN TEMP, °F	260	260	265		
FEEDWATER ECON OUT TEMP, °F	312	312	310		
BOILER STEAM PRESSURE, PSIG	132	132	132		
SMOKE DENSITY 0-100%	15%	10%	10%		

KVB

TEST NO.		6	6	6		
DRAFT GAUGES						
WINDBOX	"H_2O	0.90	1.00	0.80		
OFA	"H_2O	7.50	7.50	7.50		
FURNACE DRAFT	"H_2O	-0.19	-0.16	0.21		
BOILER OUT	"H_2O	-1.00	-1.00	1.00		
ECON OUT	"H_2O	-3.30	-3.30	3.30		
DUST COLLECTOR OUT	"H_2O	-7.70	-7.80	7.60		
STOKER COMP						
1	"H_2O	0.01	0.05	0.00		
2	"H_2O	0.38	0.46	0.29		
3	"H_2O	0.48	0.55	0.36		
4	"H_2O	0.49	0.58	0.38		
5	"H_2O	0.30	042	0.26		
6	"H_2O	0.00	0.00	0.00		
CONTROLS						
BOILER RATING		102	102	102		
STOKER CONTROL		84	86	80		
OFA RATIO		55	55	55		
STEAM/AIR RATIO		60	62	60		
I.D. FAN DAMPER CONTROL		37	42	38		
BOILER MASTER		95	100	100		
FUEL RATIO		90	90	90		
OFA CONTROL		52	52	52		
F.D. FAN CONTROL		58	64	60		
COAL GATE POSITION		3.8 3.8	3.8 3.8	3.8 3.8		
		L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 50,250
Coal Flow, lb/hr 4,900
Evaporation, lb stm/lb coal 10.26
% Steam Capacity 100.5

TEST NO.	7	7	7		
TEST DATE	10/25	10/25	10/25		
TEST COAL	Brilliant - Alabama Washed (not crushed)				
TEST CONDITIONS	Full Load (50,000#/hr) 8.0% O_2 - 5" H_2O OFA				
COAL					
COAL SCALE COUNTER x 200#/dump	25337	25355	25 386		
TIME OF READING	1:05 "	2:50	3:05		
STEAM					
INTEGRATOR READING x 500	132089	132184	132290		
TIME OF READING	12:50	1:47	2:50		
CHART RECORDER					
STEAM FLOW, LB/HR	49.5	50.0	47.0		
FEEDWATER PRESSURE, PSIG	350	320	340		
F.D. AIR (RELATIVE) 82	1.5	75	82		
Steam Drum Level	1.5	1.5	1.5		
ECON IN GAS TEMP °F	520	520	515		
ECON OUT GAS TEMP °F	405	390	390		
FEEDWATER ECON IN TEMP, °F	260	270	270		
FEEDWATER ECON OUT TEMP, °F	310	300	300		
BOILER STEAM PRESSURE, PSIG	134	134	133		
SMOKE DENSITY 0-100%	10%	10%	10%		

KVB

TEST NO.	7	7	7		
DRAFT GAUGES					
WINDBOX "H_2O	1.10	0.80	0.70		
OFA "H_2O	5.00	5.00	5.00		
FURNACE DRAFT "H_2O	-0.13	-0.14	0.16		
BOILER OUT "H_2O	-1.00	-0.90	0.80		
ECON OUT "H_2O	-3.20	-2.80	2.50		
DUST COLLECTOR OUT "H_2O	-7.60	-6.70	6.20		
STOKER COMP					
1 "H_2O	0.12	0.04	0.02		
2 "H_2O	0.60	0.40	0.34		
3 "H_2O	0.64	0.44	0.38		
4 "H_2O	0.56	0.41	0.36		
5 "H_2O	0.23	0.20	0.11		
6 "H_2O	0.00	0.00	0.00		
CONTROLS					
BOILER RATING	102	110	102		
STOKER CONTROL	70	70	63		
OFA RATIO	55	55	55		
STEAM/AIR RATIO	74	75	75		
I.D. FAN DAMPER CONTROL	38	40	38		
BOILER MASTER	76	80	65		
FUEL RATIO	90	90	92		
OFA CONTROL	40	38	38		
F.D. FAN CONTROL	54	60	47		
COAL GATE POSITION	4.1 4.1	4.1 4.1	4.1 4.1		
	L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 50,000
Coal Flow, lb/hr 5200
Evaporation, lb stm/lb coal 9.6
% Steam Capacity 100.0

TEST NO.	8	8	8		
TEST DATE	10/26	10/26	10/26		
TEST COAL	Brilliant-Alabama Washed (not crushed)				5" H₂O
TEST CONDITIONS	100% Load (50,000#/hr) opt O₂ (70%) opt OFA				
COAL					
COAL SCALE COUNTER X 200#/dump	25707	25733	25759		
TIME OF READING	9:40	10:41	11:40		
STEAM					
INTEGRATOR READING X 500	133549	133652	133749		
TIME OF READING	9:30	10:33	11:30		
CHART RECORDER					
STEAM FLOW, LB/HR	50.0	50.0	50.0		
FEEDWATER PRESSURE, PSIG	350	350	350		
F.D. AIR (RELATIVE)	75%	78%	78%		
Steam Drum Level	1.5	1.5	1.5		
ECON IN GAS TEMP °F	515	520	520		
ECON OUT GAS TEMP °F	390	395	390		
FEEDWATER ECON IN TEMP, °F	260	260	265		
FEEDWATER ECON OUT TEMP, °F	310	306	308		
BOILER STEAM PRESSURE, PSIG	132	133	133		
SMOKE DENSITY 0-100%					

KVB

TEST NO.		8	8	8		
DRAFT GAUGES						
WINDBOX	"H_2O	0.70	0.80	.80		
OFA	"H_2O	5.00	4.80	4.80		
FURNACE DRAFT	"H_2O	-0.19	-0.19	-0.16		
BOILER OUT	"H_2O	-0.90	-0.90	-0.95		
ECON OUT	"H_2O	-2.75	-2.95	-3.00		
DUST COLLECTOR OUT	"H_2O	-6.40	-6.90	-6.80		
STOKER COMP						
1	"H_2O	0.00	0.00	0.00		
2	"H_2O	0.23	0.30	0.32		
3	"H_2O	0.28	0.40	0.40		
4	"H_2O	0.25	0.39	0.40		
5	"H_2O	0.03	0.10	0.14		
6	"H_2O	0.00	0.00	0.00		
CONTROLS						
BOILER RATING		102	102	102		
STOKER CONTROL		68	73	77		
OFA RATIO		55	55	55		
STEAM/AIR RATIO		71	71	71		
I.D. FAN DAMPER CONTROL		38	40	40		
BOILER MASTER		69	72	78		
FUEL RATIO		100	100	100		
OFA CONTROL		38	38	38		
F.D. FAN CONTROL		52	56	59		
COAL GATE POSITION		4.1 4.1	4.1 4.1	4.1 4.1		
		L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 20,250
Coal Flow, lb/hr 2250
Evaporation, lb stm/lb coal 9.0
% Steam Capacity 40.5

TEST NO.	9	9	9		
TEST DATE	10/27	10/27	10/27		
TEST COAL	Alabama Washed - (not crushed) Brilliant				
TEST CONDITIONS	Lo Load (25,000 #/hr) 5" H_2O OFA				
COAL					
COAL SCALE COUNTER X 200 #/dump	26099	26110	26121.5		
TIME OF READING	10:35	11:35	12:35		
STEAM					
INTEGRATOR READING X 500	135066	135108	135147		
TIME OF READING	10:25	11:27	12:25		
CHART RECORDER					
STEAM FLOW, LB/HR	22.5	20.0	20.0		
FEEDWATER PRESSURE, PSIG	325	325	325		
F.D. AIR (RELATIVE)	65%	50%	50%		
Steam Drum Level	0.5	0.1	0.1		
ECON IN GAS TEMP °F	420	415	410		
ECON OUT GAS TEMP °F	350	345	340		
FEEDWATER ECON IN TEMP, °F	270	270	270		
FEEDWATER ECON OUT TEMP, °F	320	320	320		
BOILER STEAM PRESSURE, PSIG	124	123	123		
SMOKE DENSITY 0-100%	5%	5%	5%		

KVB

TEST NO.		9	9	9		
DRAFT GAUGES						
WINDBOX	"H_2O	0.70	0.60	0.50		
OFA	"H_2O	5.00	4.80	4.80		
FURNACE DRAFT	"H_2O	-0.20	-0.20	-0.19		
BOILER OUT	"H_2O	-0.65	-0.60	-0.60		
ECON OUT	"H_2O	-2.00	-1.80	-1.65		
DUST COLLECTOR OUT	"H_2O	-4.60	-4.34	-3.60		
STOKER COMP						
1	"H_2O	0.04	0.02	0.00		
2	"H_2O	0.37	0.30	0.25		
3	"H_2O	0.42	0.33	0.25		
4	"H_2O	0.39	0.31	0.23		
5	"H_2O	0.01	0.05	0.05		
6	"H_2O	0.00	0.00	0.00		
CONTROLS						
BOILER RATING		102	102	102		
STOKER CONTROL		47	45	45		
OFA RATIO		55	55	55		
STEAM/AIR RATIO		83	83	83		
I.D. FAN DAMPER CONTROL		38	38	38		
BOILER MASTER		50	50	51		
FUEL RATIO		90	90	90		
OFA CONTROL		39	39	39		
F.D. FAN CONTROL		42	43	46		
COAL GATE POSITION		4.1 | 4.1	4.1 | 4.1	4.1 | 4.1		
		L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 36,782
Coal Flow, lb/hr 3717
Evaporation, lb stm/lb coal 9.9
% Steam Capacity 73.6

TEST NO.	10				
TEST DATE	10/29				
TEST COAL	Alabama - Brillant				
TEST CONDITIONS	75% load				
COAL					
COAL SCALE COUNTER X 200#/dump	26690	26707	26725		
TIME OF READING	11:45	12:42	1:38		
STEAM					
INTEGRATOR READING X500 →					
TIME OF READING	11:40	12:40	1:35		
CHART RECORDER	137275	137348	137416		
STEAM FLOW, LB/HR	37.5	36.5	35.0		
FEEDWATER PRESSURE, PSIG	337	330	335		
F.D. AIR (RELATIVE)	75%	78%	79%		
Steam Drum Level	1.0	1.0	1.0		
ECON IN GAS TEMP °F	480	480	475		
ECON OUT GAS TEMP °F	380	380	382		
FEEDWATER ECON IN TEMP, °F	260	260	263		
FEEDWATER ECON OUT TEMP, °F	310	310	310		
BOILER STEAM PRESSURE, PSIG	128	128	127		
SMOKE DENSITY 0-100%					

KVB

TEST NO.						
DRAFT GAUGES						
WINDBOX	"H_2O	0.80	0.90	.7		
OFA	"H_2O	2.50	2.50	2.50		
FURNACE DRAFT	"H_2O	-0.20	-0.18	-0.19		
BOILER OUT	"H_2O	-0.70	-0.75	-0.70		
ECON OUT	"H_2O	-2.35	-3.40	-2.15		
DUST COLLECTOR OUT	"H_2O	-5.70	-6.00	-5.20		
STOKER COMP						
1	"H_2O	0.00	0.03	0.00		
2	"H_2O	0.22	0.32	025		
3	"H_2O	0.35	0.45	0.36		
4	"H_2O	0.26	0.39	026		
5	"H_2O	0.01	0.08	0.00		
6	"H_2O	0.00	0.00	0.00		
CONTROLS						
BOILER RATING		102	102	102		
STOKER CONTROL		52	61	54		
OFA RATIO		55	55	55		
STEAM/AIR RATIO		75	76	76		
I.D. FAN DAMPER CONTROL		36	36	35		
BOILER MASTER		57	68	60		
FUEL RATIO		90	90	90		
OFA CONTROL		27	26	26		
F.D. FAN CONTROL		50	61	51		
COAL GATE POSITION		4.1 | 4.1	4.1 | 4.1	4.1 | 4.1		
		L | R	L | R	L | R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 51,102
Coal Flow, lb/hr 5,213
Evaporation, lb stm/lb coal 9.8
% Steam Capacity 102.2

TEST NO.	11				
TEST DATE	10/30	10/30	10/30		
TEST COAL	Alabama washed - Brilliant - (not crushed)				
TEST CONDITIONS	Full Load (50,000 #/hr) Lo O2 Lo OFA				
COAL					
COAL SCALE COUNTER x200#/dump	27100	27127	27153		
TIME OF READING	12:42	1:42	2:44		
STEAM					
INTEGRATOR READING x500	138822	138925	139023		
TIME OF READING	12:38	1:38	2:36		
CHART RECORDER					
STEAM FLOW, LB/HR	50.5	50+ pegged	50+		
FEEDWATER PRESSURE, PSIG	355	350	350		
F.D. AIR (RELATIVE)	77%	82%	82%		
Steam Drum Level	1.6	1.7	1.8		
ECON IN GAS TEMP °F	510	530	525		
ECON OUT GAS TEMP °F	395	405	405		
FEEDWATER ECON IN TEMP, °F	260	260	260		
FEEDWATER ECON OUT TEMP, °F	300	310	310		
BOILER STEAM PRESSURE, PSIG	136	135	136		
SMOKE DENSITY 0-100%					

KVB

TEST NO.	11				
DRAFT GAUGES					
WINDBOX "H_2O	0.90	0.95	.85		
OFA "H_2O	2.50	2.50	2.50		
FURNACE DRAFT "H_2O	-0.20	-0.19	-0.18		
BOILER OUT "H_2O	-0.80	-0.90	-0.80		
ECON OUT "H_2O	-2.70	-2.80	-2.70		
DUST COLLECTOR OUT "H_2O	-6.35	-6.60	-6.30		
STOKER COMP					
1 "H_2O	0.05	0.03	0.01		
2 "H_2O	0.55	0.52	0.42		
3 "H_2O	0.53	0.53	0.41		
4 "H_2O	0.47	0.44	0.36		
5 "H_2O	0.03	0.03	0.01		
6 "H_2O	0.00	0.00	0.00		
CONTROLS					
BOILER RATING	102	102	102		
STOKER CONTROL	73	72	72		
OFA RATIO	55	55	55		
STEAM/AIR RATIO	66	66	66		
I.D. FAN DAMPER CONTROL	38	35	36		
BOILER MASTER	82	79	80		
FUEL RATIO	90	90	90		
OFA CONTROL	27	27	27		
F.D. FAN CONTROL	58	55	56		
COAL GATE POSITION	4.0 4.0	4.0 4.0	4.0 4.0		
	L R	L R	L R		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 29,357
Coal Flow, lb/hr 3077
Evaporation, lb stm/lb coal 9.5
% Steam Capacity 58.7

TEST NO.	12				
TEST DATE	11-6-79				
TEST COAL	Unwashed				
TEST CONDITIONS	60% load				
COAL					
COAL SCALE COUNTER	29971	29984	30001	30001	
TIME OF READING	1508	1605	1705	17:21	
STEAM					
INTEGRATOR READING	149357	149414	149474	149494	
TIME OF READING	15:00	16:00	17:00	1720	
CHART RECORDER					
STEAM FLOW, LB/HR	31,000	29,000	30,000		
FEEDWATER PRESSURE, PSIG	290	280	280		
F.D. AIR (RELATIVE)	85	100	100		
Drum level	+.5	+.4	+.7		
ECON IN GAS TEMP °F	460	465	470		
ECON OUT GAS TEMP °F	395	383	390		
FEEDWATER ECON IN TEMP, °F	270	266	270		
FEEDWATER ECON OUT TEMP, °F	320	320	330		
BOILER STEAM PRESSURE, PSIG	126	124	122		
SMOKE DENSITY 0-100%	5	10	10		

KVB

TEST NO.						
DRAFT GAUGES						
WINDBOX	"H_2O	+1.3	+1.7	+2.4		
OFA	"H_2O	+3.5	+3.6	+3.5		
FURNACE DRAFT	"H_2O	-.21	-.20	-.20		
BOILER OUT	"H_2O	-.7	-.7	-.8		
ECON OUT	"H_2O	-2.6	-3.1	-3.2		
DUST COLLECTOR OUT	"H_2O	-6.2	-7.6	-7.8		
STOKER COMP						
1	"H_2O	.23	.57	.70		
2	"H_2O	.60	.94	1.40		
3	"H_2O	.69	1.02	1.50		
4	"H_2O	.45	.72	1.40		
5	"H_2O	.06	.14	1.0		
6	"H_2O	0	0	0		
CONTROLS						
BOILER RATING		100	100	100		
STOKER CONTROL		47	55	90		
OFA RATIO		41	41	41		
STEAM/AIR RATIO		112	112	109		
I.D. FAN DAMPER CONTROL		36	38	38		
BOILER MASTER		54	67	100		
FUEL RATIO		85	85	87		
OFA CONTROL		22	28	48		
F.D. FAN CONTROL		56	72	100		
COAL GATE POSITION		4.8 /5.0	4.8 /5.0	4.5/4.8		

KVB

NOTES

TEST NO: 12. unwashed coal was started at Midnight. It ran til about 3:00 am
when the fire started moving toward the back of the boiler. By 500 am
the washed coal had to be put back in to get things straightened out.
A pin in the conveyor had to be replaced and coal was
jammed all along the belt. Test started at 300 pm

TEST NO:

At 400 pm ash had started becoming clinkery
by 500 pm fire started moving toward the back of the boiler
By the end of the test boiler looked a lot better

TEST NO:

TEST NO:

TEST NO:

KVB

PANEL BOARD DATA
ARMA TEST SITE E

Stm Flow, lb/hr 38,250
Coal Flow, lb/hr 4165
Evaporation, lb stm/lb coal 9.2
% Steam Capacity 16.5

TEST NO.	13				
TEST DATE	11-6-79				
TEST COAL	UNWASHED				
TEST CONDITIONS	15% Load				
COAL					
COAL SCALE COUNTER	30302	30330	30344		
TIME OF READING	902	1007	1103		
STEAM					
INTEGRATOR READING	150565	638	150718		
TIME OF READING	900	1000	1100		
CHART RECORDER					
STEAM FLOW, LB/HR	41,000	35,000	37,500		
FEEDWATER PRESSURE, PSIG	300	327	327		
F.D. AIR (RELATIVE)	100	90	95		
DRUM LEVEL	0	+.5	+.8		
ECON IN GAS TEMP °F	486	485	490		
ECON OUT GAS TEMP °F	400	385	390		
FEEDWATER ECON IN TEMP, °F	260	260	260		
FEEDWATER ECON OUT TEMP, °F	320	317	314		
BOILER STEAM PRESSURE, PSIG	129	127	126		
SMOKE DENSITY 0-100%	5	5	5		

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KVB

TEST NO.		13				
DRAFT GAUGES						
WINDBOX	"H_2O	+1.3	1.0	1.5		
OFA	"H_2O	+2.5	2.5	2.5		
FURNACE DRAFT	"H_2O	-.26	-.26	-.06		
BOILER OUT	"H_2O	-1.0	-1.0	-.8		
ECON OUT	"H_2O	-3.2	-3.0	-3.2		
DUST COLLECTOR OUT	"H_2O	-7.7	-7.0	-7.8		
STOKER COMP						
1	"H_2O	.32	.33	.28		
2	"H_2O	.88	.50	.72		
3	"H_2O	.93	.50	.84		
4	"H_2O	.80	.48	.90		
5	"H_2O	.35	.15	1.43		
6	"H_2O	0	0	.02		
CONTROLS						
BOILER RATING		100	100	100		
STOKER CONTROL		50	45	55		
OFA RATIO		41	41	40		
STEAM/AIR RATIO		61	69	69		
I.D. FAN DAMPER CONTROL		37	32	43		
BOILER MASTER		100	82	100		
FUEL RATIO		51	52	49		
OFA CONTROL		45	35	50		
F.D. FAN CONTROL		70	53	78		
COAL GATE POSITION		100	98	100		

KVB

PANEL BOARD DATA
ABMA TEST SITE E

Stm Flow, lb/hr 50,602
Coal Flow, lb/hr 5552
Evaporation, lb stm/lb coal 9.1
% Steam Capacity 101.2

TEST NO.	14				
TEST DATE	11-7-79				
TEST COAL	UNWASHED				
TEST CONDITIONS	HIGH LOAD				
COAL					
COAL SCALE COUNTER	378	429			
TIME OF READING	1329	1436			
STEAM					
INTEGRATOR READING	150900	1014	1040		
TIME OF READING	1324	1431	1447		
CHART RECORDER					
STEAM FLOW, LB/HR	50,000	50,000			
FEEDWATER PRESSURE, PSIG	300	290			
F.D. AIR (RELATIVE)	100+	100 +			
DRUM LEVEL	+1.6	+1.6			
ECON IN GAS TEMP °F	505	525			
ECON OUT GAS TEMP °F	410	405			
FEEDWATER ECON IN TEMP, °F	260	260			
FEEDWATER ECON OUT TEMP, °F	320	320			
BOILER STEAM PRESSURE, PSIG	128	132			
SMOKE DENSITY 0 100%	5				

KVB

TEST NO.		14				
DRAFT GAUGES						
WINDBOX	"H_2O	+1.6	+1.5			
OFA	"H_2O	+2.5	2.5			
FURNACE DRAFT	"H_2O	-.05	-.05			
BOILER OUT	"H_2O	-.8	-.8			
ECON OUT	"H_2O	-3.2	-3.2			
DUST COLLECTOR OUT	"H_2O	-7.9	-7.9			
STOKER COMP						
1	"H_2O	.40	.38			
2	"H_2O	.95	.90			
3	"H_2O	1.10	1.05			
4	"H_2O	1.01	.96			
5	"H_2O	.64	.60			
6	"H_2O	.12	.10			
CONTROLS						
BOILER RATING		100	101			
STOKER CONTROL		70	59			
OFA RATIO		40	40			
STEAM/AIR RATIO		67	67			
I.D. FAN DAMPER CONTROL		42	42			
BOILER MASTER		100	100			
FUEL RATIO		60	52			
OFA CONTROL		50	50			
F.D. FAN CONTROL		77	77			
COAL GATE POSITION		100	100			

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 36,316
Coal Flow, lb/hr 4688
Evaporation, lb stm/lb coal 7.7
% Steam Capacity 72.6

TEST NO.	15				
TEST DATE	11-8-79				
TEST COAL	CRUSHED				
TEST CONDITIONS	75% LOAD				
COAL					
COAL SCALE COUNTER	30826	30842		30876	
TIME OF READING	1113	1203		1321	
STEAM					
INTEGRATOR READING	152493	152540	152607	152634	
TIME OF READING	1109	1205	1300	1322	
CHART RECORDER					
STEAM FLOW, LB/HR	37500	37500	35000		
FEEDWATER PRESSURE, PSIG	337	300	292		
F.D. AIR (RELATIVE)	80	85	75		
DRUM LEVEL	+.8	+1.0	+.8		
ECON IN GAS TEMP °F	465	465	465		
ECON OUT GAS TEMP °F	315	315	310		
FEEDWATER ECON IN TEMP, °F	260	260	260		
FEEDWATER ECON OUT TEMP, °F	310	310	310		
BOILER STEAM PRESSURE, PSIG	129	124	128		
SMOKE DENSITY 0-100%	5	5			

KVB

TEST NO.	15				
DRAFT GAUGES					
WINDBOX "H_2O	0.8	1.4	0.9		
OFA "H_2O	2.5	2.5	2.5		
FURNACE DRAFT "H_2O	-.26	-.20	-.25		
BOILER OUT "H_2O	-.7	-.8	-.7		
ECON OUT "H_2O	-2.3	-3.0	-2.2		
DUST COLLECTOR OUT "H_2O	-5.5	-7.0	-5.2		
STOKER COMP					
1 "H_2O	.06	.25	.12		
2 "H_2O	.30	.66	.38		
3 "H_2O	.44	.72	.44		
4 "H_2O	.26	.38	.24		
5 "H_2O	.06	.14	.04		
6 "H_2O	0	0	0		
CONTROLS					
BOILER RATING	101	101	101		
STOKER CONTROL	57	66	52		
OFA RATIO	40	40	40		
STEAM/AIR RATIO	88	88	88		
I.D. FAN DAMPER CONTROL	35	37	37		
BOILER MASTER	65	75	60		
FUEL RATIO	90	90	90		
OFA CONTROL	25	30	25		
F.D. FAN CONTROL	58	65	50		
COAL GATE POSITION	4.0/4.0	4.0/4.0	4.0/4.0		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 50,800
Coal Flow, lb/hr 4800
Evaporation, lb stm/lb coal 10.6
% Steam Capacity 101.6

TEST NO.	16				
TEST DATE	11-9-79				
TEST COAL	crushed				
TEST CONDITIONS	100% load				
COAL					
COAL SCALE COUNTER	31289	31316	31349		
TIME OF READING	1130	1239	1400		
STEAM					
INTEGRATOR READING	154059	154169	154307	154313	
TIME OF READING	1130	1235	1356	1400	
CHART RECORDER					
STEAM FLOW, LB/HR	50,000	50,000	50,000		
FEEDWATER PRESSURE, PSIG	337	320	337		
F.D. AIR (RELATIVE)	100	90	90		
ECON IN GAS TEMP °F	510	510	510		
ECON OUT GAS TEMP °F	390	395	395		
FEEDWATER ECON IN TEMP, °F	260	260	260		
FEEDWATER ECON OUT TEMP, °F	310	310	310		
BOILER STEAM PRESSURE, PSIG	130	134	134		
SMOKE DENSITY 0-100%	20		20		

TEST NO.		16				
DRAFT GAUGES						
WINDBOX	"H_2O	1.6	1.4	1.3		
OFA	"H_2O	3.5	4.0	4.0		
FURNACE DRAFT	"H_2O	-.20	-.20	-.20		
BOILER OUT	"H_2O	-0.8	-.8	-.8		
ECON OUT	"H_2O	-2.9	-2.9	-2.9		
DUST COLLECTOR OUT	"H_2O	-7.2	-7.2	-6.8		
STOKER COMP						
1	"H_2O	.42	.50	.35		
2	"H_2O	.98	1.08	.80		
3	"H_2O	.96	1.00	.76		
4	"H_2O	.95	.84	.68		
5	"H_2O	.20	.22	.18		
6	"H_2O	0	0	0		
CONTROLS						
BOILER RATING		100	100	100		
STOKER CONTROL		75	76	73		
OFA RATIO		40	40	40		
STEAM/AIR RATIO		85	86	72		
I.D. FAN DAMPER CONTROL		35	36	35		
BOILER MASTER		100	82	80		
FUEL RATIO		94	85	92		
OFA CONTROL		32	32	32		
F.D. FAN CONTROL		63	67	60		
COAL GATE POSITION		4.2/4.0	4.2/4.0	4.2/4.0		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 27,750

Coal Flow, lb/hr 2191

Evaporation, lb stm/lb coal 12.7

% Steam Capacity 56.5

TEST NO.	17				
TEST DATE	11-10-79				
TEST COAL	CRUSHED				
TEST CONDITIONS	LOW LOAD				
COAL					
COAL SCALE COUNTER	31703	31717	31724		
TIME OF READING	915	1011	11:10		
STEAM					
INTEGRATOR READING	155439	155493	155550		
TIME OF READING	908	1004	11:08		
CHART RECORDER					
STEAM FLOW, LB/HR	28,000	29,000	28000		
FEEDWATER PRESSURE, PSIG	288	288	288		
F.D. AIR (RELATIVE)	65	65	65		
ECON IN GAS TEMP °F	435	450	450		
ECON OUT GAS TEMP °F	360	360	360		
FEEDWATER ECON IN TEMP, °F	275	274	270		
FEEDWATER ECON OUT TEMP, °F	313	315	315		
BOILER STEAM PRESSURE, PSIG	126	126	126		
SMOKE DENSITY 0-100%	0	0	0		

TEST NO.		17				
DRAFT GAUGES						
WINDBOX	"H_2O	0.80	0.95	0.80		
OFA	"H_2O	2.0	2.0	2.0		
FURNACE DRAFT	"H_2O	-0.22	-.20	-0.22		
BOILER OUT	"H_2O	-0.50	-0.5	-0.5		
ECON OUT	"H_2O	-1.7	-1.9	-1.6		
DUST COLLECTOR OUT	"H_2O	-4.0	-4.4	-4.2		
STOKER COMP						
1	"H_2O	.20	0.20	0.18		
2	"H_2O	.44	0.55	.42		
3	"H_2O	.52	.58	.44		
4	"H_2O	.40	0.43	.32		
5	"H_2O	.04	.03	.04		
6	"H_2O	0	0	0		
CONTROLS						
BOILER RATING		100	100	100		
STOKER CONTROL		51	50	48		
OFA RATIO		41	41	41		
STEAM/AIR RATIO		81	81	84		
I.D. FAN DAMPER CONTROL		37	35	37		
BOILER MASTER		59	55	55		
FUEL RATIO		90	90	90		
OFA CONTROL		25	22	22		
F.D. FAN CONTROL		50	47	47		
COAL GATE POSITION		4.0/4.0	4.0/4.1	4.1/4.1		

KVB

PANEL BOARD DATA
ABMA TEST SITE K

Stm Flow, lb/hr 39,000
Coal Flow, lb/hr 4040
Evaporation, lb stm/lb coal 9.7
% Steam Capacity 78.0

TEST NO.	18				
TEST DATE	11-12-79				
TEST COAL	washed Ala				
TEST CONDITIONS	baseline				
COAL					
COAL SCALE COUNTER	32530	32552	32574	32592	32611
TIME OF READING	1200	1300	1402	1500	1600
STEAM					
INTEGRATOR READING	158568	158652	158732	158810	158884
TIME OF READING	12:00	1300	1400	1500	1600
CHART RECORDER					
STEAM FLOW, LB/HR	42,500	40,000	40,000	37,500	36,000
FEEDWATER PRESSURE, PSIG	308	300	300	300	292
F.D. AIR (RELATIVE)	82	82	80	75	77
DRUM LEVEL	+1.5	+1.0	+1.0	+1.0	+0.8
ECON IN GAS TEMP °F	495	495	487	482	475
ECON OUT GAS TEMP °F	390	390	385	382	380
FEEDWATER ECON IN TEMP, °F	260	260	260	260	262
FEEDWATER ECON OUT TEMP, °F	315	315	324	320	324
BOILER STEAM PRESSURE, PSIG	131	130	130	129	129
SMOKE DENSITY 0-100%	5	5	5	5	5

KVB

PANEL BOARD DATA
ABMA TEST SITE K

page 2

Stm Flow, lb/hr____________
Coal Flow, lb/hr____________
Evaporation, lb stm/lb coal____________
% Steam Capacity____________

TEST NO.	18				
TEST DATE	11-12-79				
TEST COAL	washed Ala				
TEST CONDITIONS	baseline				
COAL					
COAL SCALE COUNTER	32631				
TIME OF READING	17:00				
STEAM					
INTEGRATOR READING	158958				
TIME OF READING	17:00				
CHART RECORDER					
STEAM FLOW, LB/HR	38,000				
FEEDWATER PRESSURE, PSIG	300				
F.D. AIR (RELATIVE)	77				
DRUM LEVEL	+0.9				
ECON IN GAS TEMP °F	480				
ECON OUT GAS TEMP °F	383				
FEEDWATER ECON IN TEMP, °F	262				
FEEDWATER ECON OUT TEMP, °F	313				
BOILER STEAM PRESSURE, PSIG	129				
SMOKE DENSITY 0-100%	5				

KVB

TEST NO.	18				
DRAFT GAUGES					
WINDBOX "H_2O	1.0	1.0	1.1	1.0	0.9
OFA "H_2O	2.5	2.5	2.5	2.5	2.5
FURNACE DRAFT "H_2O	-.25	-.25	-.25	-.26	-.25
BOILER OUT "H_2O	-.7	-.7	-.7	-.7	-.6
ECON OUT "H_2O	-2.5	-2.5	-2.6	-2.5	-2.4
DUST COLLECTOR OUT "H_2O	-5.8	-6.0	-6.5	-5.8	-5.5
STOKER COMP					
1 "H_2O	.10	.08	.07	.10	.08
2 "H_2O	.50	.44	.40	.44	.40
3 "H_2O	.56	.50	.40	.42	.40
4 "H_2O	.52	.37	.30	.28	.26
5 "H_2O	.20	.14	.10	.10	.10
6 "H_2O	0	0	0	0	0
CONTROLS					
BOILER RATING	101	101	102	102	102
STOKER CONTROL	58	53	53	53	51
OFA RATIO	42	42	42	41	41
STEAM/AIR RATIO	89	84	89	90	90
I.D. FAN DAMPER CONTROL	36	35	33	33	36
BOILER MASTER	62	60	60	60	59
FUEL RATIO	90	90	90	90	90
OFA CONTROL	26	23	23	23	23
F.D. FAN CONTROL	59	53	53	53	52
COAL GATE POSITION	4.4/4.5	4.5/4.5	4.5/4.5	4.2/4.3	4.3/4.4

page 2

TEST NO.	18				
DRAFT GAUGES					
WINDBOX "H_2O	1.0				
OFA "H_2O	2.5				
FURNACE DRAFT "H_2O	-.26				
BOILER OUT "H_2O	-.7				
ECON OUT "H_2O	-2.5				
DUST COLLECTOR OUT "H_2O	-6.0				
STOKER COMP					
1 "H_2O	0.09				
2 "H_2O	0.50				
3 "H_2O	0.48				
4 "H_2O	0.32				
5 "H_2O	0.14				
6 "H_2O	0				
CONTROLS					
BOILER RATING	102				
STOKER CONTROL	55				
OFA RATIO	4/2				
STEAM/AIR RATIO	90				
I.D. FAN DAMPER CONTROL	39				
BOILER MASTER	63				
FUEL RATIO	90				
OFA CONTROL	23				
F.D. FAN CONTROL	59				
COAL GATE POSITION	4.3/4.5				

KVB

NOTES

TEST NO: Impinger #1 H_2O_2 sol'n 750 ml H_2O_2

Impinger #2+3 $AgNO_3$ and $(NH_4)_2S_2O_8$ sol'n

73.0209 gm $(NH_4)_2$

+ 5.0866 gm $AgNO_3$

+ 1600 ml H_2O

TEST NO:

TEST NO:

TEST NO:

TEST NO:

SECTION 2.0

PARTICULATE DATA

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2.2	PARTICULATE DATA SHEETS	50
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BOILER OUTLET DIMENSIONS
11'4½" x 2'6½" = 28.91 ft²

PARTICULATE DATA SUMMARY
PART I

LOCATION: SITE K - BOILER OUTLET

TEST NO.	Total Mass mgm.	Dry Gas Volume ft³	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H₂O	Pitot ΔP "H₂O	Orifice ΔH "H₂O	Stack Gas Temp. °R	Excess O₂ %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10⁶BTU	Flue Gas MW g/g mole
01	1409.4	42.19	48	29.81	-0.90	0.115	0.713	1035	8.8	72	0.378	0.837	9743	29.28
02	407.2	33.66	29	30.14	-0.73	0.073	0.430	958	13.6	72	0.378	0.837	9769	29.06
03	686.8	37.77	42.8	30.32	-0.79	0.079	0.508	992	10.9	74.083	0.378	0.837	9702	29.13
04	969.9	41.84	65	30.19	-1.10	0.103	0.668	1028	8.2	72.167	0.378	0.837	9723	29.07
05	929.3	40.124	61.2	30.07	-1.05	0.106	0.643	1030	7.5	72	0.378	0.837	9557	29.27
06	778.8	42.188	62.5	30.03	-1.20	0.12	0.73	1038	8.3	72	0.378	0.837	9769	29.13
07	1118.4	43.208	60.2	30.10	-1.20	0.121	0.735	1036	7.2	72.5	0.378	0.837	9856	29.28
08	847.1	43.183	66.5	30.24	-1.10	0.109	0.698	1030	7.3	73	0.378	0.837	9744	29.19
09	272.5	32.023	33.4	30.22	-0.51	0.056	0.39	932	13.0	72	0.378	0.837	9747	28.97
10	696.1	40.115	56.4	29.92	-1.0	0.1035	0.637	996	10.1	72	0.378	0.837	9590	28.98
11	779.0	41.442	75.3	30.06	-1.15	0.110	0.661	1032	6.4	72	0.378	0.837	9629	29.05
12	979.8	43.825	40.4	30.26	-.92	0.123	0.751	984	12.9	72	0.378	0.837	9814	29.11
13	1367.0	46.357	48.1	30.35	-.98	0.133	0.812	996	11.6	72	0.378	0.837	9989	29.05
14	2226.8	36.078	49.8	30.25	-.97	0.162	0.994	1040	8.5	51	0.378	0.837	9751	29.08
15	1137.5	42.355	54.0	30.07	-.92	0.106	0.654	993	10.0	73	0.378	0.837	9936	29.08
16	1702.0	42.110	74.5	29.66	-1.0	0.11	0.68	1026	6.0	72	0.378	0.837	9786	29.09
17	525.0	34.061	39.7	29.96	-.66	0.074	0.437	967	10.8	72	0.378	0.837	9980	29.06

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PARTICULATE DATA SUMMARY
PART II

Location SITE K - BOILER OUTLET

TEST NO.	LOAD %	O_2 %	CONDITIONS		EMISSIONS			Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
				Corr	lb/10^6BTU	GR/SCF	LB/HR				
01	97.4	8.8		1.240	1.250	0.517	103	5.13	26.45	389	98
02	49.9	13.6		0.737	0.740	0.185	31	3.89	20.23	325	93
03	71.2	10.9		0.799	0.809	0.277	47	5.03	21.53	333	101
04	99.5	8.2		0.758	0.766	0.3[illegible]2	64	6.79	24.88	373	104
05	95.5	7.5		0.755	0.776	0.305	69	6.70	25.23	376	99
06	94.9	8.3		0.655	0.658	0.283	58	6.53	27.04	399	98
07	100.5	7.2		0.850	0.847	0.396	82	6.15	27.02	401	99
08	100.0	7.3		0.639	0.644	0.299	59	6.73	25.55	383	104
09	40.5	13.0		0.477	0.480	0.130	19	4.66	17.48	290	101
10	73.6	10.1		0.707	0.724	0.267	52	6.24	24.70	379	97
11	102.2	6.4		0.571	0.582	0.288	57	7.88	25.83	384	101
12	58.7	12.9		1.251	1.242	0.340	73	4.13	26.60	418	96
13	76.5	11.6		2.060	2.025	0.644	143	4.62	27.79	432	98
14	101.2	8.5		2.202	2.218	0.939	225	6.06	31.39	466	101
15	72.6	10.0		1.127	1.114	0.415	82	5.71	24.93	385	99
16	101.6	6.0		1.231	1.235	0.628	124	7.79	25.95	383	102
17	55.5	10.8		0.698	0.687	0.237	40	5.22	20.55	325	95

#15900 Rev.

STACK DIAM. 3' x 3' = 9.0 ft²

PARTICULATE DATA SUMMARY
PART I

LOCATION: SITE K - DC OUTLET

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
01	257.6	47.529	61	29.81	+0.75	0.568	0.749	869	8.7	72	0.248	0.817	9743	29.27
02	114.5	37.64	25.5	30.14	+0.80	0.343	0.437	825	13.8	72	0.248	0.817	9769	29.16
03	182.1	35.72	41.6	30.32	+0.37	0.313	0.431	849	11.0	72.7	0.248	0.817	9702	29.10
04	195.8	45.64	66.7	30.19	+0.48	0.544	0.648	864	8.1	72.083	0.248	0.817	9723	29.13
05	192.7	41.08	52.7	30.07	+0.51	0.498	0.597	862	8.8	72	0.248	0.817	9557	29.21
06	157.4	45.33	57.6	30.03	+0.25	0.555	0.644	867	9.3	72	0.248	0.817	9769	29.14
07	166.3	45.45	57	30.10	+1.5	0.582	0.673	866	8.1	72	0.248	0.817	9856	29.19
08	144.5	43.64	63	30.24	+0.08	0.553	0.616	862	7.8	72	0.248	0.817	9744	29.16
09	74.1	29.59	32.4	30.22	+0.31	0.24	0.29	808	13.2	72	0.248	0.817	9747	28.91
10	120.8	42.13	53	29.42	+1.8	0.498	0.575	855	10.2	72.25	0.248	0.817	9590	29.04
11	161.6	42.36	74	30.06	+1.8	0.507	0.587	870	7.4	72	0.248	0.817	9629	29.01
12	173.9	46.26	42.3	30.26	+1.0	0.53	0.63	850	13.6	72	0.248	0.817	9894	28.85
13	135.9	45.13	46.1	30.35	+1.4	0.61	0.643	857	11.6	72	0.248	0.817	9989	29.03
14	147.4	33.20	40.7	30.25	+1.3	0.62	0.654	871	8.7	72.51	0.248	0.817	9751	29.26
15	127.1	33.34	44.3	30.04	+0.8	0.43	0.44	844	10.1	72	0.248	0.817	9956	29.10
16	178.4	39.17	67.9	29.66	+0.66	0.46	0.48	858	6.4	72	0.248	0.817	9786	29.27
17	98.2	31.19	36.1	29.96	+0.40	0.29	0.31	824	11.3	72	0.248	0.817	9980	29.02

#15900 rev.

PARTICULATE DATA SUMMARY
PART II

Location SITE K - DC OUTLET

TEST NO.	LOAD %	O2 %	CONDITIONS	EMISSIONS				Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %	TEMP CORR
				Corr	lb/10^{6}BTU	GR/SCF	LB/HR					
01	97.4	8.7		0.199	0.201	0.084	12	5.74	52.48	288	109	104
02	49.9	13.8		0.190	0.191	0.047	6	3.09	39.59	231	105	103
03	71.2	11.0		0.226	0.229	0.078	10	5.16	41.82	236	99	94
04	99.5	8.1		0.148	0.150	0.066	10	6.41	51.03	285	108	103
05	95.5	8.8		0.158	0.162	0.067	9	5.33	48.79	272	107	106
06	94.9	9.3		0.134	0.134	0.053	8	5.65	51.77	286	105	103
07	100.5	8.1		0.129	0.128	0.056	8	5.57	52.80	244	103	101
08	100.0	7.8		0.112	0.113	0.050	7	6.33	51.34	287	102	100
09	40.5	13.2		0.144	0.145	0.038	4	4.88	32.59	196	100	97
10	73.6	10.2		0.118	0.121	0.044	6	5.62	48.78	273	101	97
11	102.2	7.4		0.124	0.127	0.059	8	7.60	49.56	274	105	101
12	58.7	13.6		0.239	0.237	0.059	9	4.10	50.11	285	107	105
13	76.5	11.6		0.197	0.194	0.062	10	4.49	53.70	304	99	98
14	101.2	8.7		0.161	0.162	0.068	11	5.43	54.46	303	103	103
15	72.6	10.1		0.147	0.076	0.054	7	5.44	44.95	256	94	91
16	101.0	6.4		0.140	0.141	0.070	9	7.54	47.05	260	102	99
17	55.5	11.3		0.144	0.141	0.046	5	4.95	36.59	212	101	99

PARTICULATE

DATA

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 95 %

TEST NUMBER 1
DATE 10-11-79
OPERATOR JD
FUEL ALA WASHED
SITE K
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #1 1		.12	.70	5752.28	560	—	310		100	100		2.0
2		.11	.65	5754.04	560	270	300		95	100		2.0
3		.08	48	5755.54	550	300	310		95	110		1.5
4		.09	.53	5757.27	555	320	300		84	110		1.8
5		.05	.30	5758.45	560	390	300		75	112		1.3
6		.05	.30	5759.59	560	320	310		80	110		1.5
7		.10	.59	5761.15	550	300	310		80	110		1.9
8		.05	.30	5762.37	520	300	310		78	112		1.3
PORT #2 1		.18	1.05	5764.65	560	250	290		70	110		3.5
2		.16	.95	5766.80	560	250	300		75	115		3.0
3		.14	.82	5768.77	600	280	290		75	118		2.7
4		.12	.70	5770.60	600	280	290		80	120		2.3
5		.10	.59	5772.17	590	290	300		78	122		1.8
6		.11	.65	5773.75	590	290	300		75	120		2.3
7		.12	.70	5775.70	590	295	300		75	120		2.4
8		.10	.59	5777.32	550	295	300		75	120		1.8
PORT #3 1		.13	.75	5779.10	550	200	290		80	125		2.4
2		.16	.95	5781.23	560	280	290		80	122		3.2
3		.15	.88	5783.19	570	310	300		80	122		2.9
4		.15	.88	5785.25	580	300	290		75	120		2.9
5		.15	.88	5787.29	580	300	290		72	125		2.9
6		.12	.70	5789.08	600	300	300		75	120		2.5
7		.12	.70	5790.82	580	300	300		75	122		2.5
8		.10	.59	5792.53	520	290	310		78	125		2.2
Average		.15	.71	42.19	575							

METER VOL. END
START 5750.34
SAMPLE VOL. ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.70"H_2O	29.84

Percent O_2 =

pH Imp 1 — 2.5
" " 2 — 3.2

Nomograph Setup

P_{meter} =
C =
P_{stack} =
T_{stack} =
T_{meter} =
ΔP =
$\Delta H_@$ =
Noz(Ideal) =
% H_2O = 5.1
Noz(Actual) = .378
Ms = 26.40

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	138	100	38
#2	106	100	6
#3	0	0	0
		Total	44
#4	g(End)	g(Start)	Δgrams
Silica Gel	204	200	4
		Total Vol. H_2O	48 ml

PARTICULATE

DATA

V_{SCF} 47.44 ft³
V_w 2.89 ft³
% moist 5.77%

Sampling Time Per Point, Min
3.0

Leak Check Rate
Vac in. Hg ft³/min
Before
After

ISOKINETICS = 105.

TEST NUMBER 1
DATE 10-11-79
OPERATOR RAP
FUEL ALABAMA
SITE EK
PROBE LOCATION MECH OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT 1 1	12:30	.34	.51	3785.00	395	250	280	↓	↓	88	↓	2.8
2		.53	.70	3787.96	400	265	265			82		3.2
3		.62	.81	3789.11	400	280	275			82		3.8
4		.64	.84	3791.26	410	—	—			—	—	
5		.53	.70	3793.21	410	270	270			92		3.2
6		.49	.65	3795.08	405	280	260			92		3.1
7		.48	.64	3796.93	405	265	275			90		3.1
8		.55	.73	3798.92	400	280	270			92		3.7
PORT 2 1		.54	.71	3800.90	410	—	230			93		3.3
2		.62	.82	3803.01	415	220	235			95		3.8
3		.67	.90	3805.[illegible]	415	250	250			96		4.3
4		.66	.87	3807.32	415	270	250			98		—
5		.66	.87	3809.42	415	270	260			98		4.0
6		.61	.80	3811.43	410	280	255			99		3.8
7		.48	.64	3813.26	405	288	260			100		3.2
8		.50	.66	3815.09	405	270	260			102		3.3
PORT 3 1		.59	.78	3817.08	415	200	240			102		3.7
2		.68	.90	3819.22	420	225	250			102		4.2
3		.72	.95	3821.42	420	245	255			102		4.6
4		.60	.79	3823.40	415	260	260			102		3.[illegible]
5		.52	.68	3825.25	410	270	250			103		3.3
6		.52	.68	3827.09	410	270	270			103		3.3
7		.52	.68	3829.00	410	270	270			104		3.5
8		.51	.67	3830.802	410	270	270			105		3.4
Average		0.568	0.749	47.529	409							

NONCOMPENSATED METER

METER VOL. END
START 3783.273
SAMPLE VOL. ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	+.75 H_2O	29.81

Percent O_2 =

Nomograph Setup
P_{meter} = 29.81 C =
P_{stack} = 29.87 T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal) =
% H_2O = 5.7 Noz(Actual) = .248
K_f = 5.364 =

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	133	-	100	=	33
#2	116	-	100	=	16
#3	0	-	0	=	0
				Total	49
#4	g(End)		g(Start)		Δgrams
Silica Gel	212	-	200	=	12
				Total Vol. H_2O	61 ml

Ph at start 5.9
Ph Imp. #1 2.5
Ph Imp #2 2.5

3.37 4.45 14.43 370

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft³/min

Before

After

Sampling Time Per Point, Min: 3

ISOKINETICS = 93.7

TEST NUMBER 2

DATE 10-13-79

OPERATOR JD

FUEL ALA. WASHED

SITE K

PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #3 1		.10	.59	5799.50	500	230	250		80	90		1.8
2		.10	.59	5801.17	500	280	250		70	90		1.8
3		.13	.75	—	510	300	280		75	95		2.0
4		.14	.82	5805.87	520	310	300		78	100		2.2
5		.13	.75	5807.98	500	315	300		72	100		2.0
6		.11	.65	5808.69	510	300	300		70	105		1.9
7		.09	.53	5810.34	515	300	300		73	105		1.7
8		.07	.41	5811.67	490	300	300		70	105		1.5
PORT #2 1		.07	.41	5813.14	500	250	300		80	110		1.5
2		.09	.53	5814.68	500	270	300		70	110		1.8
3		.08	.48	5816.27	505	290	300		70	110		1.6
4		.08	.48	5817.71	505	300	300		70	110		1.6
5		.07	.41	5819.14	500	300	300		70	110		1.5
6		.07	.41	5820.55	505	300	300		72	112		1.5
7		.08	.48	5822.07	505	300	300		70	110		1.6
8		.04	.24	5823.10	480	300	300		75	110		1.2
PORT #1 1		.05	.30	5824.30	500	250	300		80	115		1.3
2		.05	.30	5825.49	500	275	300		70	110		1.3
3		.03	.18	5826.42	480	280	300		70	110		1.1
4		.05	.30	5827.59	490	300	300		75	115		1.3
5		.04	.24	5828.68	480	300	300		78	112		1.2
6		.03	.18	5829.59	480	300	300		78	112		1.2
7		.03	.18	5830.52	490	300	300		78	112		1.2
8		.02	.12	5831.26	490	300	300		78	112		1.0
Average		.073	.430	33.66	498							

Homograph Setup

METER VOL. END

START 5797.60

SAMPLE VOL. ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	—	30.14

Percent O₂ =

P_{meter} =

P_{stack} =

T_{meter} =

ΔH_g =

% H_2O =

C =

T_{stack} =

ΔP =

Noz (Ideal) =

Noz (Actual) = .378

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	118 -	100 =	18
#2	109 -	100 =	9
#3	0 -	0 =	0
		Total	27
#4	g(End)	g(Start)	Δgrams
Silica Gel	202 -	200 =	2
		Total Vol. H_2O	29 ml

STATIC — - .73 "H_2O

1 IMP — pH — 3.0

2nd " — pH — 3.0

PARTICULATE

DATA

Vscf - 37.96
Vw — 1.21
%M — 3.1

Sampling Time Per Point, Min
3.0

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 104.2 %

TEST NUMBER 2
DATE 10-13-79
OPERATOR ENS
FUEL ALA.
SITE K
PROBE LOCATION STACK

VEI — 39.42

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port #1 1		.33	.44	—	370	215	130	145		70		2
2		.37	.49	3840.18	370	235	140	135		70		2
3		.45	.59	3842.96	370	240	140	145		70		2.8
4		.41	.54	—	370	240	140	140		70		2.5
5		.43	.57	3845.88	370	240	150	145		70		2.5
6		.48	.64	3847.44	370	240	152	150		70		2.9
7		.45	.59	3849.44	370	245	155	150		72		2.5
8		.45	.59	3851.22	370	240	160	152		75		2.5
Port #2 1		.30	.39	3852.80	365	180	130	120		80		1.8
2		.34	.44	3854.30	365	220	170	125		75		2.0
3		.34	.44	3855.92	365	235	170	135		75		2.0
4		.42	.575	3857.75	365	240	175	150		80		2.5
5		.32	.42	3859.30	365	245	175	155		80		2.0
6		.32	.42	3860.85	362	250	190	160		80		2.0
7		.38	.50	3862.75	365	250	195	160		80		2.5
8		.40	.53	3864.19	345	250	205	170		80		2.5
Port #3 1		.19	.22	3865.25	360	250	190	175		82		1.8
2		.20	.23	3866.50	360	250	190	180		82		1.8
3		.26	.29	3867.61	360	250	190	180		82		1.8
4		.28	.32	3869.08	362	250	205	160		85		1.8
5		.26	.30	3870.20	362	255	215	170		85		1.5
6		.30	.34	3871.78	362	255	215	160		85		1.8
7		.30	.34	3873.26	362	250	205	160		82		1.8
8		.26	.30	3874.41	365	250	205	160		88		1.8
Average		.34	.44	37.64	365					78		

METER VOL. END
START 3836.77
SAMPLE VOL. ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	+.80"H_2O	30.14

Percent O_2 =

Nomograph Setup

F_{meter} =
F_{stack} =
T_{meter} =
ΔH_g =
% H_2O =
C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	120	-	100	=	20
#2	104	-	100	=	4
#3	0	-	0	=	0
				Total	24
#4	g(End)		g(Start)		Δgrams
Silica Gel	201.5	-	200	=	1.5
				Total Vol. H_2O	25.5 ml

1imp pH — 3.0
2imp pH — 3.0
start pH — 5.9

PARTICULATE

DATA

Vscf - 38.32
Vw — 2.03 ft³
% M — 5.07
VEL — 21.24

Sampling Time Per Point, Min
3

Leak Check Rate

Vac in. Hg ft³/min

Before

After

ISOKINETICS = 104.5

TEST NUMBER 3
DATE 10-15-79
OPERATOR JD
FUEL ALA.
SITE K
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #1 1		.05	.32	5838.51	520	250	250		78	99		1.8
2	+30 sec.	.05	.32	—	520	250	250		80	100		1.8
3		.04	.26	5841.36	500	300	280		80	100		1.5
4		.05	.32	5842.58	520	300	280		79	103		1.8
5		.04	.26	5843.71	520	310	285		76	110		1.6
6		.03	.19	5844.63	520	300	300		78	110		1.4
7		.03	.19	5845.62	530	245	305		78	110		1.4
8		.03	.19	5846.59	500	285	305		78	112		1.5
PORT #2 1		.08	.52	5848.23	530	250	300		82	115		2.3
2		.14	.90	5850.28	530	270	300		77	115		3.2
3		.09	.58	5852.87	540	300	300		75	116		2.8
4		.09	.58	5853.53	540	305	300		78	118		2.8
5		.08	.52	5855.13	540	300	300		73	118		2.3
6		.07	.45	5856.54	550	300	300		75	120		2.2
7		.07	.45	—	545	300	300		75	120		2.2
8		.06	.39	5859.39	500	300	300		75	120		2.1
PORT #3 1	+60 sec	.09	.58	5861.56	540	300	300		75	120		2.9
2		.09	.58	5863.74	540	300	300		74	120		2.9
3		.12	.78	5865.61	550	300	300		74	120		3.1
4		.17	1.10	5867.71	550	300	300		74	120		3.9
5		.12	.78	5869.59	560	300	300		76	120		3.2
6		.11	.71	5871.45	560	300	300		77	120		3.1
7	+30 sec.	.11	.71	5873.55	560	300	300		78	120		3.1
8		.08	.52	5875.11	510	300	300		78	120		2.5
Average		.079	.51	37.77	532	—			—			—

METER VOL. END
START 5837.34
SAMPLE VOL. ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.29" H₂O	30.32

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .378
=

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	184	-	100	=	84
#2	51	-	100	=	-49
#3	0	-	0	=	0
				Total	35
#4	g(End)		g(Start)		Δgrams
Silica Gel	266.8	-	259	=	7.8
				Total Vol. H₂O	42.8 ml

initial pH ——— 7.0
1st IMP ——— 2.5
2nd Imp ——— 2.5

PARTICULATE

DATA

V_{SCF} 36.24 ft^3
V_w 1.97 ft^3
% Moist 5.2 %

Sampling Time Per Point, Min
3.0 min

Leak Check Rate
Vac in. Hg
ft³/min
Before
After

ISOKINETICS = 95.2.

Vel = 41.58 ft/sec

TEST NUMBER 3
DATE 10-15-79
OPERATOR E. SMITH
FUEL COAL (ALA)
SITE K
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Left port — Port #1 1		.30	.34	—	385	260	330	170		87		2.50
2		.34	.40	—	385	265	320	200		89		3.00
3		.30	.34	—	385	270	310	210		90		2.50
4		.32	.37	—	385	270	315	210		90		2.75
5		.36	.42	3880.25	385	270	320	210		90		3.10
6		.36	.42	3881.65	390	280	340	240		90		3.10
7		.40	.46	3883.20	395	290	330	250		92		3.40
8	3.7 min	.37	.43	3886.46	365	290	315	280		99		3.20
Port-2 1		.35	.41	3887.88	390	280	320	190		97		3.00
2		.41	.47	—	395	290	320	220		97		3.20
3		.47	.54	—	395	295	320	220		99		3.90
4		.36	.42	—	395	298	320	228		99		3.0
5		.29	.34	—	395	299	325	225		100		2.80
6		.20	.23	—	390	299	320	225		100		2.00
7		.23	.27	—	385	300	320	220		101		2.00
8		.21	.24	3897.24	380	300	315	220		102		2.00
Port #3 1		.39	.45	—	385	290	310	185		102		3.10
2		.41	.47	—	390	298	320	190		105		3.30
3		.49	.57	3901.92	395	310	330	240		105		4.00
4		.49	.57	—	395	315	325	235		105		4.00
5		.47	.54	—	395	320	315	245		108		3.90
6		.46	.53	—	395	320	310	230		110		3.90
7		.50	.58	—	395	315	315	230		110		4.00
8		.47	.54	3910.27	385	310	315	235		110		3.90
Average		.3725	.4313	35.72	389.0					99.0		

METER VOL. END
START 3874.55
SAMPLE VOL. ft³

C_{Pitot}	Stack Press. in Hg Gauge	Barometric Pressure
.817	+.97 "H_2O	30.32

Percent O_2 =

Nomograph Setup

P_{meter} = 30.32 =
P_{stack} = 30.35 T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal) =
% H_2O = Noz(Actual) =

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	125	-	100	=	25
#2	106	-	100	=	6
#3	0	-	0	=	0
				Total	31
#4	g(End)		g(Start)		Δgrams
Silica Gel	258.6	-	248.0	=	10.6
				Total Vol. H_2O	41.6 ml

PH START – 7.0
PH 1ST Imp. 3.0
PH 2nd Imp 3.0

PARTICULATE

DATA

V_{SCF} — 42.29
V_{H_2O} — 3.08 ft³
% M — 6.8
vel — 24.78 ft/sec.

Sampling Time Per Point, Min
3

Leak Check Rate

Vac in. Hg ft³/min

Before

After

ISOKINETICS = 104.8

TEST NUMBER 4
DATE
OPERATOR JD
FUEL ALA.
SITE K
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port #3 1		.15	.96	5880.82	580	250	300		80	160		
2	+10 sec	.08	.52	5882.47	570	260	300		78	160		
3		.14	.90	5884.71	590	300	300		75	102		
4		.14	.90	5886.79	590	310	310		75	102		
5		.15	.96	5889.81	600	300	300		75	105		
6		.14	.90	5890.98	600	300	310		75	110		
7		.13	.85	5893.96	600	300	300		75	110		
8		.09	.58	5894.61	450	300	300		75	110		
Port #2 1		.13	.85	5896.62	570	300	300		75	112		
2		.12	.77	5898.53	560	300	250		75	112		
3		.09	.58	5900.20	560	300	300		78	112		
4		.10	.65	5901.89	560	300	300		75	112		
5		.13	.85	5903.71	580	300	300		75	112		
6		.13	.85	5905.69	580	300	300		73	112		
7		.14	.90	5907.70	570	300	300		70	112		
8		.07	.45	5909.15	540	300	300		70	112		
Port #1 1		.08	.52	5910.66	560	300	300		75	115		
2		.09	.58	5912.35	570	300	300		72	115		
3		.07	.45	5913.71	570	300	300		70	115		
4		.06	.39	5915.11	560	300	300		70	115		
5		.06	.39	5916.42	560	300	300		70	115		
6		.07	.45	5917.78	570	300	300		70	116		
7		.06	.39	5919.19	580	300	300		70	116		
8		.06	.39	5920.49	540	300	300		70	117		
Average	.103	.667	41.84	567.9		—						

Nomograph Setup

METER VOL. END
START 5878.65
SAMPLE VOL. ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	1.1 "H₂O	30.19

Percent O_2 =

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .378

	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	148	-	160	=	48
#2	110	-	160	=	10
#3	0	-	0	=	0
				Total	58
#4	g(End)		g(Start)		Δgrams
Silica Gel	216	-	209	=	7
				Total Vol. H₂O	65 ml

pH - initial — 5.9
Imp#1 — 2.5
Imp#2 — 2.5

PARTICULATE

DATA V_{SCF} 46.12
V_{H_2O} 3.16
% Moist 6.47
Vel 50.80 ft/sec

Sampling Time Per Point, Min
3 min.

Leak Check Rate
Vac in. Hg ft³/min
Before
After

ISOKINETICS = 103.2

TEST NUMBER 4
DATE 10-16-79
OPERATOR E. SMITH
FUEL ALA.-COAL
SITE K
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
Right Port 1-1		.56	.67	3912.30	405	280	250	160	—	85		5.0
1-2		.66	.79	3914.25	410	290	265	200	—	85		5.9
1-3		.53	.63	3916.32	402	300	280	205	—	85		5.0
1-4		.58	.69	3918.07	402	300	300	212	—	85		5.3
1-5		.55	.65	3919.90	402	300	300	220	—	88		5.1
1-6		.54	.64	3922.35	405	298	305	220	—	89		5.1
1-7		.54	.64	3924.44	402	295	308	225	—	90		5.1
1-8	+5 sec.	.55	.65	3926.56	392	290	300	230	—	90		5.3
Port 2 2-1		.52	.62	3928.30	409	200	250	160	—	92		4.9
2-2		.63	.75	3930.38	410	235	260	205	—	92		6.0
2-3		.57	.68	3932.09	410	260	280	220	—	95		5.3
2-4		.58	.69	3934.11	408	280	300	230	—	95		5.5
2-5		.49	.59	3935.90	405	295	320	235	—	99		4.9
2-6		.50	.60	3938.00	402	302	330	240	—	100		4.9
2-7		.50	.60	3940.25	405	310	320	235	—	100		4.9
2-8		.58	.69	3942.13	400	302	302	215	—	102		5.5
Left Port 3 3-1		.40	.48	3943.60	402	302	328	180	—	105		3.6
3-2		.40	.48	3945.22	402	318	330	235	—	102		3.6
3-3		.54	.64	3946.90	405	320	330	230	—	105		5.0
3-4		.46	.55	3948.48	405	320	330	240	—	105		4.3
3-5		.66	.79	3950.65	408	320	320	245	—	105		6.0
3-6		.58	.69	3952.42	410	320	330	255	—	108		5.3
3-7		.58	.69	3954.28	410	320	330	245	—	110		5.3
3-8		.55	.65	3956.04	400	315	330	245	—	110		5.0
Average		.5438	.6479	45.64	404.6					96.8		

METER VOL. END 3956.04
START 3910.40
SAMPLE VOL. ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
	4.48	30.19

Percent O_2 =

PH-START 6.8
PH-1st IMP. 3.0
PH-2nd Imp 3.0

Nomograph Setup

P_{meter} = 30.19 C =
P_{stack} = 30.23 T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)=
SET POINT 1.55 =

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	148	-	100	=	48
#2	108	-	100	=	8
#3	0	-	0	=	0
				Total	56
#4 Silica Gel	g(End) 218.5	-	g(Start) 207.8	=	Δgrams 10.7

Total Vol. H_2O 66.7 ml

DATA Vel 25.21

V_{scF} 40.39

V_{H_2O} 2.9

% Moist 6.7

Sampling Time Per Point, Min 3.0

Before

After

98.4

TEST NUMBER 5

DATE 10-24-79

OPERATOR R.AP

FUEL ALABAMA

SITE K

PROBE LOCATION BREAT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #1 1	10:06	.05	.32	5926.12	530	295	320		88	98		<2.0
2		.07	.45	5927.56	540	300	320		80	97		<2.0
3		.06	.39	5928.96	535	350	320		72	98		<2.0
4		.07	.45	5930.47	540	280	330		75	99		<2.0
5		.08	.52	5932.06	560	280	330		75	102		<2.0
6		.05	.32	5933.36	560	285	315		75	102		<2.0
7		.04	.28	5934.43	565	285	305		75	105		<2.0
8		.03	.19	5935.31	530	285	290		76	110		<2.0
PORT #2 1		.16	1.02	5937.45	560	250	270		80	111		2.3
2		.12	.77	5939.34	580	275	260		80	112		2.1
3		.11	.72	5941.18	580	310	270		78	115		2.0
4		.14	.83	5943.12	585	310	280		75	115	*	2.2
5		.12	.71	5944.84	600	300	280		78	116		2.0
6		.10	.58	5946.49	590	300	285		78	120		<2.0
7		.09	.54	5947.78	575	290	290		79	121		<2.0
8		.07	.41	5949.28	540	285	290		80	122		<2.0
PORT #3 1		.19	1.15	5951.48	580	230	285		80	118		2.6
2		.18	1.05	5953.62	600	310	300		78	128		2.4
3		.20	1.18	5955.91	610	320	300		78	128		2.8
4		.16	.94	5957.98	600	295	295		78	130		2.3
5		.13	.78	5959.84	590	250	310		78	128		2.1
6		.10	.59	5961.48	580	260	310		75	130		<2.0
7		.11	.64	5963.20	590	285	310		75	125		2.0
8		.12	.70	5964.880	550	300	310		73	128		2.1
Average		.1063	.643	40.124	569.6							

* NOMOGRAPH CHANGE - .32

5924.756

-1.05" H2O 30.07

.30.07

.29.99

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	136	-	100	=	36
#2	115	-	100	=	15
#3	0	-	0	=	0
				Total	51
#4	g(End)		g(Start)		Δgrams
	200.2	-	190	=	10.2
				Total Vol. H_2O	61.2 ml

PH START 7.0

PH 1ST IMP 3.0

PH 2ND IMP 3.0

PARTICULATE

DATA

Vel 48.61

V_{scF} 44.37

V_{H_2O} 2.50

% moist 5.3

Sampling Time Per Point, Min
3 min.

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = 106.4.

TEST NUMBER 5

DATE 10-23-79

OPERATOR E. SMITH

FUEL COAL BLD.

SITE K

PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Left port 1-1		.34	.40	—	398	240	230	140		70		3.2
1-2		.34	.40	—	400	250	235	175		70		—
1-3		.46	.55	—	400	260	230	190		70		4.5
1-4		.62	.75	3961.00	402	260	238	200		70		5.9
1-5		.43	.52	3963.12	402	270	245	195		70		4.2
1-6		.54	.64	3964.80	405	268	235	200		70		5.0
1-7		.46	.55	3967.60	402	265	230	205		70		4.5
1-8		.50	.60	3968.50	400	270	240	200		72		5.0
2-1		.48	.57	3970.41 3972.20	408	255	260	170		70		4.6
2-2		.52	.62	3974.15	405	260	250	195		72		5.1
2-3		.56	.67	3976.60	405	265	240	195		75		5.4
2-4		.60	.76	3978.13	405	270	245	210		78		6.2
2-5		.52	.62	3980.02	405	272	240	210		78		5.1
2-6		.46	.55	3982.75	402	270	250	205		79		4.6
2-7		.50	.60	3984.58	402	270	240	210		80		4.9
2-8		.48	.57	3985.38	390	265	230	220		72		4.8
Right port 3-1		.42	.50	3987.09	398	260	245	175		80		4.0
3-2		.42	.50	3988.71	402	265	250	210		80		4.0
3-3		.48	.57	3990.49	402	265	230	205		80		4.6
3-4		.60	.76	—	405	260	220	200		81		6.0
3-5		.58	.69	3994.50	405	270	240	208		82		5.4
3-6		.55	.65	3996.38	405	270	250	205		82		5.2
3-7		.52	.62	3998.25	407	265	240	205		82		5.0
3-8		.56	.67	4000.15	395	260	235	205		85		5.3
Average		.4975	.5971	44.08	402.1					75.8		

METER VOL. END 4000.15

START 3956.07

SAMPLE VOL. ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
	.51	30.07

Percent O_2 =

Nomograph Setup

P_{meter} = 30.07 C =

P_{stack} = 30.11 T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal) =

% H_2O = Noz(Actual) =

SET POINT 1.55

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	128	-	100	=	28
#2	112	-	100	=	12
#3	0	-	0	=	0
				Total	40
#4 Silica Gel	g(End) 185.4	-	g(Start) 172.7	=	Δgrams 12.7

Total Vol. H_2O 52.7 ml

ph at start 7.0

ph Imp #1 2.5

ph Imp #2 3.5

PARTICULATE

DATA Vel. 26.91

V_{SCF} 44.61

V_{H_2O} 2.96

% Moist 6.2

Sampling Time Per Point, Min 3.0

Before

After

ISOKINETICS = 98.0

TEST NUMBER 6

DATE 10-24-79

OPERATOR R.AP

FUEL ALABAMA

SITE K

PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #2 1		.175	1.05	5967.37	560	330	300		82	112		3.0
2	13:32	.20	1.21	5969.65	580	270	320		78	113		3.3
3		.19	1.20	5972.03	605	250	300		72	112		3.3
4		.23	1.40	5974.52	620	240	300		78	117		4.0
5		.185	1.12	5976.75	615	265	—		72	118		3.5
6		.155	.95	5978.83	610	280	—		75	120		3.2
7		.15	.92	5980.85	605	285	—		72	122		3.0
8		.145	.88	5982.82	580	295	—		73	123		3.0
PORT #2 1		.12	.73	5984.63	570	250	—		82	120		2.8
2		.13	.78	5986.51	575	240	—		78	122		2.9
3		.11	.67	5988.29	580	310	—		71	123		2.8
4		.125	.75	5990.11	580	320	—		72	123		2.9
5		.135	.82	5991.96	595	320	—		72	125		3.0
6		.13	.79	5993.79	600	315	—		75	126		3.0
7		.13	.79	5995.66	595	310	—		75	128		3.0
8		.09	.55	5997.27	540	310	—		75	125		2.4
PORT #3 1		.05	.30	5998.42	545	250	260		80	122		<2.0
2		.06	.36	5999.63	560	270	285		80	122		2.0
3		.07	.42	6001.010	565	330	280		75	120		2.2
4		.08	.49	6002.47	570	300	290		80	128		2.3
5		.085	.52	6003.93	570	300	285		78	128		2.4
6		.06	.36	6005.19	580	310	280		73	130		2.0
7		.05	.30	6006.33	580	295	285		75	130		<2.0
8		.04	.24	6007.288	530	290	290		76	133		<2.0
Average		.12	.13		578							

METER VOL. END 6007.288

START 5965.100

SAMPLE VOL. 42.188

.837 -1.2" H_2O

30.03

3003

29.94

6.5

Imp.	Vol. (End)		Vol. (Start)		Vol. (ml)
#1	146	-	100	=	46
#2	108	-	100	=	8
#3		-	0	=	0
				Total	54

#4	(End)		(Start)		Grams
Silica gel	226.0	-	217.5	=	8.5

Total Vol. H_2O 62.5 ml

PH START 6.5

PH 1ST IMP 2.5

PH 2ND IMP 3.0

PARTICULATE

DATA Vel 51.55
V_{SCF} 45.57
V_{H_2O} 2.73
% Moist 5.7

Sampling Time Per Point, Min. 3 min.

Leak Check Rate
Vac in. Hg ft³/min
Before
After

.103.4.

TEST NUMBER #6
DATE 10-24-79
OPERATOR E. Smith
FUEL COAL ALA
SITE K
PROBE LOCATION STACK

Right port

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1-1		.45	.52	4001.90	405	245	225	135		70		3.5
1-2		.60	.70	4003.70	410	265	230	165		70		4.8
1-3		.70	.81	4006.02	410	270	230	180		70		5.8
1-4		.70	.81	4008.18	410	280	240	190		72		5.8
1-5		.60	.70	4010.15	410	270	220	185		75		5.1
1-6		.56	.65	4012.08	407	275	240	200		77		5.0
1-7		.46	.53	4013.80	400	280	255	200		79		4.2
1-8		.48	.55	4015.56	395	280	255	195		79		4.4
2-1		.54	.63	4017.30	410	265	260	160		80		4.9
2-2		.64	.74	4019.48	410	270	260	195		80		5.8
2-3		.70	.81	—	410	270	235	200		80		6.2
2-4		.68	.78	4023.68	410	270	240	205		80		6.0
2-5		.60	.70	4026.25	410	275	255	210		80		5.5
2-6		.50	.58	4027.44	410	280	250	200		82		4.7
2-7		.45	.52	4029.01	408	275	270	200		85		4.4
2-8		.52	.60	4030.93	402	270	265	200		85		4.8
3-1		.51	.61	4032.70	410	260	230	130		85		4.6
3-2		.56	.65	—	412	270	250	185		85		5.0
3-3		.58	.68	4036.55	410	280	255	190		85		5.2
3-4		.58	.68	4038.25	408	280	255	190		85		5.2
3-5		.55	.64	4040.40	409	275	255	195		85		5.0
3-6		.40	.46	4042.00	404	278	265	200		85		3.9
3-7		.46	.53	4043.68	403	278	270	210		85		4.4
3-8		.50	.58	4045.48	403	275	265	210		87		4.7
Average		.555	.644	45.33	407.3					80.3		

Left port

4045.48
4000.15

.25 pos. 30.03

P_{meter} 30.03
P_{stack} 30.05

Imp.	Vol. (End)	Vol. (Start)	Vol. (ml)
#1	138	100	38
#2	108	100	8
#3	0	0	0
		Total	46
#4	203.4	191.8	11.6

Total Vol. H_2O 57.6 ml

PH START 6.5
PH Imp 1st 2.5
PH Imp 2nd 3.0

SET POINT 1.6

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PARTICULATE

DATA Vel 27.01

V_{SCF} 45.80

V_{H2O} 2.85

% Moist 5.9

3 MIN.

99.5.

TEST NUMBER 7

DATE 10-25-79

OPERATOR R.A.P

FUEL ALABAMA

SITE K

PROBE LOCATION BOR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port 1 1	12:42	.075	.46	6016.44	550	240	310		69	100		2.3
2		.075	.46	6017.90	545	265	310		76	101		2.5
3		.07	.42	6019.39	550	310	310		78	102		2.3
4		.075	.46	6020.80	555	320	310		77	103		2.3
5		.08	.49	6022.38	560	320	315		75	103		2.6
6		.07	.42	6023.75	560	320	315		75	107		2.3
7		.05	.30	6024.98	555	305	315		75	110		2.1
8		.03	.18	6025.88	510	290	315		78	110		2.0
Port 2 1		.14	.85	6027.85	580	250	290		90	110		3.6
2		.14	.85	6029.83	595	230	295		78	112		3.7
3		.07	.42	6031.32	590	290	290		80	114		2.5
4		.10	.60	6032.93	580	300	295		80	117		3.0
5		.12	.73	6034.75	590	320	295		73	115		3.4
6		.12	.73	6036.60	595	320	300		72	117		3.4
7		.13	.78	6038.49	590	320	300		72	120		3.6
8		.085	.52	6040.05	540	320	310		72	120		3.0
Port 3 1		.25	1.51	6042.59	590	230	295		80	120		6.3
2		.22	1.35	6045.07	595	260	300		73	121		6.0
3		.25	1.51	6047.59	620	300	300		80	120		6.7
4	3.5	.155	.94	6049.98	620	330	300		72	122		4.8
5		.17	1.02	6052.15	605	300	300		78	122		5.0
6		.155	.95	6054.23	605	250	300		77	122		4.8
7		.15	.91	6056.27	600	265	300		77	124		4.7
8		.13	.79	6058.125	550	280	295		78	125		4.0
Average		.1213	.7354	43.208	576.3							

METER VOL. 6058.125

6014.917

Nomograph Setup

T_{meter} = 30.10 C

T_{stack} = 30.01 T_{stack}

.931	-1.2" H2O	30.10

PH START 7.0

PH 1ST Imp. 2.5

PH 2nd Imp 2.5

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	141	-	100	=	41
#2	110	-	100	=	10
#3	0	-	0	=	0
				Total	51
#4	g(End)		g(Start)		Δgrams
Silica Gel	230.3	-	221.1	=	9.2
				Total Vol. H_2O	60.2 ml

PARTICULATE

DATA Vel 52.58
Vscf 45.80
V_{H_2O} 2.70
% Moist 5.6

Sampling Time Per Point, Min: 3 MIN.

Before
After

Leak Check Rate
Vac
in. Hg ft³/min

ISOKINETICS - 100.7.

TEST NUMBER STACK # 7
DATE 10-25-79
OPERATOR E. SMITH
FUEL COAL ALA.
SITE K
PROBE LOCATION STACK

	Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
			ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Left port	1-1		.42	.48	4047.20	402	300	320	170		70		3.3
	1-2		.48	.55	4048.96	402	310	310	210		75		4.0
	1-3		.60	.70	4051.79	402	312	300	245		70		5.0
	1-4		.62	.72	4052.86	408	312	308	255		70		5.2
	1-5		.58	.67	4054.80	408	310	300	250		75		4.9
	1-6		.60	.70	4056.75	408	305	300	245		79		5.2
	1-7		.57	.66	4058.67	405	305	315	280		80		5.0
	1-8		.38	.44	4060.30	395	310	320	270		72		3.4
	2-1		.50	.58	4062.07	402	280	290	170		82		4.1
	2-2		.60	.70	4064.03	408	280	270	220		80		5.0
	2-3		.70	.81	4066.12	409	270	275	220		82		5.9
	2-4		.70	.81	4068.20	410	280	255	225		82		5.9
	2-5		.64	.74	4070.20	410	285	265	230		85		5.6
	2-6		.52	.60	4072.00	405	280	260	225		80		4.5
	2-7		.44	.51	4073.62	402	270	260	225		85		4.0
	2-8		.42	.48	4075.25	395	275	260	230		88		3.6
Right port	3-1		.55	.64	4076.94	402	270	240	150		82		4.0
	3-2		.65	.75	4079.00	409	275	265	210		90		6.1
	3-3		.72	.83	—	410	280	220	210		90		6.6
	3-4		.72	.83	—	410	2.90	245	235		90		6.6
	3-5		.72	.83	4085.22	410	295	255	225		90		6.6
	3-6		.65	.75	4087.20	410	300	255	245		92		6.0
	3-7		.60	.70	4089.00	410	299	249	245		98		5.5
	3-8		.58	.67	4090.95	401	305	280	255		92		5.3
	Average		.5816	.6729	45.45	405.5					82.5		

METER VOL. END 4090.95
START 4045.50
SAMPLE VOL. 45.45

[illegible]	[illegible]	[illegible]
.817	1.5 pos	

Percent O_2 =

Barometric Press.
T_{meter} 30.10 =
P_{stack} 30.21 T_{stack} =
P_{meter} = ΔP =
M_d = [illegible]
% H_2O = [illegible]

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	139	-	100	=	39
#2	108	-	100	=	8
#3	0	-	0	=	0
				Total	
#4	g(End)		g(Start)		Δgrams
Silica Gel	225.9	-	215.9	=	10
				Total Vol. H_2O	57 ml

PH START 7.0 SET POINT 1.6
PH 1ST Imp 2.5
PH 2ND Imp 3.0

PARTICULATE DATA

Vel 25.46
VscF 45.86
V_{H_2O} 3.15
% moist 6.4
* 3.5 minutes

Sampling Time Per Point, Min: 3.0

Before
After

Leak Check Rate
Vac
in. Hg ft³/min

[illegible] - 104.0

TEST NUMBER 8
DATE 10-26-79
OPERATOR R.A.P
FUEL ALABAMA
SITE K
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT 3 1	9.22	.145	.87	6131.59	565	310	275		85	92		3.3
2		.125	.80	6133.61	570	310	295		86	95		3.2
3	*	.205	1.32	6136.54	590	300	310		88	94		4.7
4		.185	1.20	6138.92	595	305	315		87	97		4.3
5		.18	1.15	6141.32	600	310	320		81	98		4.3
6		.16	1.02	6143.48	600	305	320		78	99		4.0
7		.13	.84	6145.47	590	300	325		77	100		3.5
		.105	.67	6147.27	530	285	325		76	102		3.0
PORT 2 1		.09	.58	6148.86	560	250	300		85	102		2.7
2		.13	.84	6150.84	585	250	300		73	108		3.5
3		.145	.93	6152.96	595	280	300		73	108		3.8
4		.145	.93	6155.04	600	300	300		75	110		3.8
5		.125	.80	6156.96	590	310	300		75	110		3.5
6		.105	.67	6158.70	585	305	300		75	111		3.2
7		.09	.58	6160.40	575	300	300		73	111		2.8
8		.07	.45	6161.80	530	295	290		75	113		2.3
PORT 1		.08	.52	6163.50	560	—	270		82	112		2.6
2		.08	.52	6165.02	560	250	280		72	113		2.6
3		.065	.42	6166.43	560	320	285		72	113		2.3
4	*	.06	.38	6167.92	560	320	280		76	—		2.2
5		.065	.42	6169.40	560	305	280		76	113		2.3
6		.06	.38	6170.66	560	270	280		88	112		2.6
7		.04	.26	6171.76	550	275	280		78	112		<2.0
8		.03	.19	6172.678	520	270	285		78	112		<2.0
Average		.1090	.6975	43.183	570							

METER VOL. END 6172.678
START 6129.495
SAMPLE VOL. ft³

.837	- 1.10	30.24

Barometric Setup
-30.24
-30.16

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	144 -	100 -	44
#2	112 -	100 -	12
#3	0 -	0 -	0
		Total	56
#4 Silica	221.9 -	211.4 -	10.5
		Total Vol. H_2O	66.5 ml

PH START 7.0
PH 1ST IMP 2.5
PH 2ND IMP 3.0

PARTICULATE

DATA Vel 50.19
V_{scf} 44.17
V_{H_2O} 2.99
% Moist. 6.3

Before
After

ISOKINETICS 102.4

TEST NUMBER #8
DATE 10-26-79
OPERATOR E. SMITH
FUEL COAL [illegible]
SITE K
PROBE LOCATION STACK

	Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
			ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Right port	1-1		.47	.54	4092.88	400	260	250	190		60		4.0
	1-2		.47	.54	4094.62	400	280	265	160		60		4.0
	1-3		.51	.59	4096.46	400	290	270	185		62		4.8
	1-4		.52	.60	4098.30	400	295	280	190		65		5.0
	1-5		.50	.58	41 —	400	300	290	205		68		4.9
	1-6		.55	.64	4102.07	402	300	290	210		70		5.4
	1-7		.55	.64	4104.01	400	300	300	212		70		5.4
	1-8		.51	.59	4105.70	399	310	298	235		72		4.9
	2-1		.47	.54	4107.43	400	300	310	160		80		4.4
	2-2		.52	.60	4109.25	400	310	320	220		80		5.0
	2-3		.70	.80	4111.33	405	312	320	220		82		6.6
	2-4		.70	.80	4113.33	408	315	325	240		82		6.6
	2-5		.64	.74	4115.50	408	315	330	240		80		6.1
	2-6		.58	.67	4117.15	408	320	320	245		88		5.6
	2-7		.52	.60	4119.00	405	320	320	235		90		5.0
	2-8		.55	.64	4120.83	390	315	320	240		90		5.4
Left port.	3-1		.40	.46	4122.40	400	308	340	170		90		3.9
	3-2		.46	.53	4124.06	403	310	340	280		91		4.4
	3-3		.56	.65	4125.88	403	315	330	240		92		5.2
	3-4		.58	.67	4127.73	405	320	320	235		92		5.4
	3-5		.56	.65	4129.50	405	320	315	240		90		5.2
	3-6		.55	.64	4131.40	402	320	310	240		92		5.2
	3-7		.48	.55	4133.10	402	320	302	250		95		4.8
	3-8		.44	.50	4134.67	400	320	305	235		95		4.2
	Average		.5329	.6158	43.64	401.9					80.7		

METER VOL. END 4134.67
START 4091.03
TOTAL 43.64

[illegible]	[illegible]	[illegible]
	.08 pos	30.24

Nomograph Setup
[illegible] 30.24
[illegible] 30.25

Imp.	Vol. (End)		Vol. (Start)		Vol. (ml)
#1	142	-	100	=	42
#2	111	-	100	=	11
#3	0	-	0	=	0
				Total	53
#4	220.5	-	210.5	=	10.0

Total Vol. H_2O 63 ml

PH START 7.0
PH 1st Imp 2.5
PH 2nd Imp 3.2

set point 1.6

PARTICULATE

DATA Vel 17.35

V_{SCF} 32.38

V_{H_2O} 1.58

% Moist 4.6

3.0

101.4

TEST NUMBER 9
DATE 10-27
OPERATOR RAP
FUEL ALABAMA
SITE K
PROBE LOCATION BLR out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT#1 1	10:21	.03	.19	6203.04	460	300	320		110	92		<2.0
2		.035	.22	6204.28	470	250	325		110	95		<2.0
3		.04	.27	6205.39	475	260	325		90	95		<2.0
4		.03	.21	6206.41	460	285	325		79	98		<2.0
5		.03	.21	6207.48	455	280	310		80	99		<2.0
6		.025	.17	6208.42	450	290	310		78	100		<2.0
7		.025	.17	6209.38	455	290	315		73	101		<2.0
8		.01	.07	6209.90	430	300	315		73	102		<2.0
PORT#2 1		.10	.68	6211.68	500	—	315		88	106		2.8
2		.055	.38	6213.08	480	350	305		72	108		2.0
3		.06	.41	6214.48	480	265	315		72	112		2.0
4		.065	.45	6215.90	485	290	310		72	111		2.2
5		.05	.34	6217.27	470	295	310		72	112		2.0
6		.05	.34	6218.51	470	300	300		72	112		2.0
7		.055	.38	6219.81	475	300	305		73	112		2.0
8		.06	.41	6221.27	455	300	310		73	112		2.2
PORT#3 1		.10	.68	6223.00	470	220	305		81	115		2.8
2		.09	.62	6224.68	465	240	305		78	116		2.8
3		.08	.55	6226.38	480	270	310		78	—		2.7
4		.085	.58	6228.00	490	295	310		78	116		2.8
5		.095	.65	6229.73	500	300	305		78	118		2.9
6		.08	.55	6231.42	505	305	310		78	118		2.8
7		.06	.41	6232.75	485	305	310		73	118		2.3
8		.05	.34	6234.070	455	305	310		79	120		2.0
Average		.056	.39	32.023	472 ~~932~~							

6234.070
6202.047
32.023

30.22
30.18

.837 -.51"H_2O 30.22

4.6

Vol. (Final)	Vol. (Start)	Vol. (ml)
122	100	22
104	100	4
0	0	0

Total

g(Final)	g(Start)	Δgrams
216.8	209.4	7.4

Total Vol. H_2O 33.4 ml

PH START 5.9
PH 1st Imp 2.5
PH 2nd Imp 3.0

PARTICULATE
DATA

Vel 32.62
V_{SCF} 29.91
V_{H_2O} 1.54
% Moist 4.9

Sampling Time per Point, Min: 3

Before
After

927

TEST NUMBER 9
DATE 10-27-79
OPERATOR MJ
FUEL ALA Wash
SITE K
PROBE LOCATION Stack

	Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
			ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Pot 1#	1	3	.20	.24	4136.16	350	255	270	150	—	71		2.0
	2	3	.25	.30	4137.52	360	265	270	182	—	71		2.5
	3	3	.22	.25	4139.75	350	270	280	175	—	73		2.1
	4	3	.22	.25	4140.03	350	280	295	175	—	75		2.1
	5	3	.23	.27	4141.29	350	275	289	190	—	77		2.5
	6	3	.20	.29	4142.47	350	280	300	195	—	80		2.1
	7	3	.19	.22	4143.64	350	280	305	205	—	80		2.0
	8	3	.24	3.0	4145.00	325	280	300	190	—	80		2.1
Pot#2	1	3	.20	.24	4146.18	350	200	260	150	—	81		2.4
	2	3	.23	.27	4147.42	350	210	280	170	—	85		2.5
	3	3	.22	.25	4148.57	350	240	290	180	—	85		2.0
	4	3	26	.31	4149.93	350	260	290	190	—	85		2.8
	5	3	.30	.36	4151.32	355	270	305	200	—	85		3.0
	6	3	.28	.34	4152.68	355	275	310	200	—	87		3.0
	7	3	.26	.31	4154.00	350	280	308	200	—	89		2.8
	8	3	.20	.24	4155.14	330	280	310	210	—	90		2.9
Pot 3s	1	3	.20	.24	4156.29	340	220	250	145	—	90		2.4
	2	3	.24	.30	4157.53	350	255	280	195	—	90		2.7
	3	3	.30	.36	4158.92	350	270	300	195	—	90		3.0
	4	3	.33	.40	4160.39	360	270	300	205	—	91		3.2
	5	3	.30	.36	4161.73	355	285	299	215	—	91		3.0
	6	3	.29	.30	4163.01	355	299	300	220	—	95		3.0
	7	3	.24	.30	4164.29	355	300	305	220	—	95		2.7
	8	3	.20	.24	4165.47	300	300	295	230	—	95		2.5
	Average		.24	.29	29.59	348					545		

135.88
29.59

.817
30.22

P_{meter} = 30.22
P_{stack} = 30.24
T_{meter} = °F
% H_2O = 4.8

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	121	100	21
#2	105	100	5
#3	0	0	0
		Total	26
#4	g(End)	g(Start)	grams
	215.9	209.5	6.4
		Total Vol. H_2O	32.4 ml

Static Pt. ~~.25~~ .31

PH START 7.0
PH 1st Imp 3.0
PH 2nd Imp 3.2

PARTICULATE DATA

Vel 24.53

V_{SCF} 40.18

V_{H_2O} 2.67

% Moist 6.2

Sampling Time per Point, Min 3.0

Vac in. Hg ft³/min

Before

After

ISOKINETICS = 97.8

TEST NUMBER #10
DATE 10-29-79
OPERATOR R.AP
FUEL ALABAMA
SITE K
PROBE LOCATION B-loc CUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port #3 1	11:30	.23	1.4	6253.84	550	260	315		90	102		4.1
2		.21	1.3	6255.39	550	310	315		80	102		4.1
3		.19	1.20	6257.70	540	340	310		78	103		4.1
4		.14	.85	6259.77	555	320	310		81	105		3.0
5		.16	.97	6261.92	565	310	310		75	107		3.2
6		.13	.80	6262.84	570	305	310		77	110		3.0
7		.125	.78	6265.74	565	300	315		77	111		3.0
8		.10	.62	6267.46	520	290	310		77	111		2.7
Port #2 1		.08	.49	6268.92	530	—	300		82	115		2.2
2		.12	.74	6270.76	545	230	310		80	115		3.0
3		.115	.70	6272.58	545	270	310		80	117		2.9
4		.095	.58	6274.28	530	285	305		80	117		2.7
5		.10	.62	6275.90	540	285	300		80	120		2.8
6		.09	.55	6277.53	545	285	310		78	120		2.7
7		.105	.65	6279.30	555	280	310		78	—		2.8
8		.065	.40	6280.60	510	280	310		78	120		2.2
Port #1 1		.08	.49	6282.16	530	—	300		82	120		2.2
2		.07	.43	6283.54	530	240	305		78	121		2.1
3		.06	.37	6284.84	520	260	300		80	122		2.0
4		.06	.37	6286.22	520	280	295		77	—		2.0
5		.055	.34	6287.46	520	280	300		78	122		<2.0
6		.035	.21	6288.45	505	285	300		78	122		<2.0
7		.04	.24	6289.50	525	280	300		80	122		<2.0
8		.03	.18	6290.403	505	275	305		80	122		<2.0
Average		.1035	.636	40.115	536.3							

6250.288 ft³

.837 -1.0" H₂O

P bar = 29.92

P stack = 29.85

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	139	-	100	=	39
#2	110	-	100	=	10
#3	0	-	0	=	0
				Total	
	g(End)		g(Start)		Δgrams
Silica gel	212.3	-	203.9	=	7.4

Total Vol. H₂O 56.4 ml

PH START 6.2
PH 1st Imp 2.5
PH 2nd Imp 2.5

PARTICULATE

DATA Vel 48.46
Vscf 42.20
V_{H_2O} 2.51
% moist 5.6

Before
After

98.5

TEST NUMBER #10
DATE 10-
OPERATOR yes
FUEL Coal AUB
SITE --
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Right port 1-1		.54	.62	4170.50	398	300	340	195		80		4.8
1-2		.46	.53	4172.25	396	310	335	255		80		4.4
1-3		.47	.54	4174.10	394	315	330	260		80		4.5
1-4		.45	.52	4175.85	385	320	330	260		80		4.4
1-5		.50	.58	4177.60	395	320	340	260		80		4.9
1-6		.55	.64	4179.48	398	320	330	265		82		5.2
1-7		.55	.64	4181.40	398	320	325	270		82		5.2
1-8		.48	.55	4183.08	390	325	320	265		85		4.6
2-1		.36	.42	4184.50	382	315	335	210		90		3.5
2-2		.49	.56	4186.28	390	320	330	250		90		4.7
2-3		.65	.75	41 —	399	325	335	265		91		6.2
2-4		.68	.78	4190.35	400	320	335	265		91		6.5
2-5		.55	.64	4192.03	399	320	340	260		92		5.2
2-6		.49	.56	—	398	320	335	265		95		4.6
2-7		.45	.52	4195.48	395	320	330	258		95		4.4
2-8		.46	.53	4197.17	382	320	320	268		98		4.5
Left port 3-1		.35	.40	4198.58	382	310	310	180		98		3.2
3-2		.52	.60	4200.30	398	310	315	245		98		5.0
3-3		.54	.63	4202.22	400	315	320	240		98		5.2
3-4		.46	.53	—	398	320	320	265		99		4.7
3-5		.50	.58	—	398	315	320	250		99		5.0
3-6		.50	.58	4207.35	400	315	320	260		99		5.0
3-7		.51	.57	—	399	320	320	270		99		5.0
3-8	3 min 15 sec	.44	.51	4210.83	395	320	330	255		100		4.4
Average		4979	.575	42.13	394.5	—	—	—	—	90.9	—	

START 4168.70

1.8 PCS

29.92
30.05

Imp.	Vol.(final)	Vol.(start)	Vol.(ml)
#1	135	100	35
#2	108	100	8
#3	0	0	0
Total			
#4	211	201.0	10
Total Vol. H_2O			53

PH START 5.9
PH 1st Imp 2.5
PH 2nd Imp 3.0

PARTICULATE

DATA Vel 25.70

V_scf 41.70

V_H2O 3.57

% Moist 7.9

3.0

[illegible] 101.7

TEST NUMBER 11
DATE 10-11-79
OPERATOR R.AP
PLANT ALABAMA
SITE K
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS ΔP	 ΔH	 Meter Reading	TEMPERATURES, °F Stack	 Probe	 Oven	 In	 Out	 Meter	O2, %	Vac.
PORT # 1 1	12:35	.07	.43	6300.56	555	270	320		91	101		3.1
2		.07	.43	6302.07	555	265	320		82	102		3.1
3		.055	.34	6303.38	560	285	320		80	102		2.8
4		.06	.37	6304.65	560	290	312		80	102		3.0
5		.07	.43	6306.20	575	295	310		78	105		3.2
6		.055	.34	6307.45	575	295	310		75	—		2.8
7		.05	.30	6308.60	565	295	310		77	108		2.5
8		.03	.185	6309.51	525	285	310		78	110		<2.0
PORT # 2 1		.125	.78	6311.45	565	220	315		75	112		4.5
2		.09	.55	6313.06	575	240	310		78	112		3.7
3		.115	.70	6314.84	590	285	310		78	112		4.3
4		.125	.78	6316.71	600	300	300		78	115		4.6
5		.14	.85	6318.70	610	310	310		72	117		5.0
6		.13	.80	6320.63	615	300	300		75	118		4.8
7		.11	.67	6322.45	600	300	300		75	120		4.2
8		.075	.46	6323.84	545	290	300		78	—		3.3
PORT # 3 1		.135	.82	6325.78	575	220	290		78	122		4.8
2		.125	.78	6327.68	580	245	285		80	120		4.8
3		.21	1.30	6330.17	600	295	295		80	120		7.2
4		.20	1.22	6332.50	615	315	295		80	120		6.8
5		.19	1.18	6334.78	610	315	310		78	122		6.8
6		.15	.72	6336.59	615	310	305		78	122		4.6
7		.15	.72	6338.45	610	305	310		77	122		4.5
8		.115	.70	6340.497	560	300	300		77	122		4.3
Average		.1102	.6606	41.442	572.3							

6299.055

30.06
29.98

.837	-1.15" H2O	30.06

.378

	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	159	100	59
#2	111	100	11
#3	0	0	0
Total			65

	(End)	(Start)	Grams
	212.0	201.7	10.3

Total Vol. H2O 75.3 ml

PH start 6.2
PH 1st Imp 2.5
PH 2nd Imp 3.0

PARTICULATE

DATA Vel 44.23
Vscf 42.62
V_{H_2O} 3.51
% Moist 7.6

3 min.

Leak Check Rate

ISOKINETICS 101.7

TEST NUMBER 11
DATE 10-30-79
OPERATOR yes
FUEL COAL (ALH)
SITE K
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Left port 1-1		.35	.41	4212.25	403	255	280	155		80		3.4
1-2		.43	.50	4214.04	405	270	280	210		80		4.3
1-3		.50	.58	4215.88	410	275	280	210		80		4.9
1-4		.53	.61	4217.68	410	280	280	215		80		5.2
1-5		.65	.75	4219.73	419	280	280	220		80		6.7
1-6		.55	.64	4221.55	415	285	295	230		80		5.8
1-7		.47	.54	4223.34	415	285	300	230		85		5.8
1-8		.40	.46	4224.89	405	280	295	220		85		4.1
2-1		.38	.44	4226.40	400	270	290	130		89		4.0
2-2		.49	.56	4228.20	405	270	280	215		88		5.1
2-3		.46	.53	4229.88	400	275	275	220		90		5.0
2-4		.49	.56	4231.56	405	280	270	220		90		5.1
2-5		.52	.60	4233.41	405	280	280	220		90		5.5
2-6		.52	.60	4235.25	410	280	280	220		90		5.5
2-7		.60	.70	4237.00	415	275	275	220		91		6.4
2-8		.56	.65	4238.94	415	275	280	225		92		6.0
Right port 3-1		.50	.58	4240.65	415	270	300	175		95		5.2
3-2		.52	.60	4242.45	419	280	305	225		95		5.3
3-3		.52	.60	4244.28	415	280	290	220		95		5.6
3-4		.58	.68	4246.09	415	280	290	225		96		6.3
3-5		.55	.64	4247.87	410	290	295	230		98		6.1
3-6		.56	.65	4249.60	410	285	300	230		98		6.2
3-7		.54	.63	4251.51	410	285	300	230		99		6.0
3-8		.50	.58	4253.26	400	280	280	220		99		5.5
Average		.5071	.5871	42.36	409.6					89.4		

4210.90

1.8 ges.

P_{meter} 30.06
P_{stack} 30.19

Vol. (End)	Vol. (Start)	ΔVol. (ml)
147	100	47
114	100	14
0	0	0
Total		
213.3	200.3	130

Total Vol. H_2O 74 ml

PH start 6.2
PH 1st imp 2.5
PH 2nd Imp 3.0

PARTICULATE

DATA

Leak Check Rate

Vac.

in. Hg ft³/min

ISOKINETICS = 97.2

Sampling Time per Point, Min
3.0

Before

After

TEST NUMBER 12
DATE 11-6-79
OPERATOR R.A.P.
FUEL Alabama unwashed
SITE K
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Out	Meter		
Port #3 1		.20	1.22	6389.92	505	270	330		90	102		2.8
2		.14	.85	6391.95	505	275	335		88	103		2.2
3		.20	1.22	6394.43	525	285	335		88	103		2.8
4		.19	1.20	6396.73	545	295	335		88	—		2.8
5		.185	1.15	6399.07	545	295	335		80	—		2.7
6		.150	.92	6401.16	545	285	335		78	105		2.3
7		.135	.82	6403.09	540	285	330		72	—		2.1
8		.11	.67	6404.81	500	280	330		72	110		2.0
Port #2 1	15:55	.115	.70	6407.30	515	—	320		72	112		2.0
2		.135	.82	6408.54	510	240	320		72	112		2.1
3		.115	.70	6410.40	530	270	320		77	111		2.0
4		.14	.85	6412.39	540	280	320		77	114		2.2
5		.135	.82	6414.34	545	290	310		77	—		2.1
6		.12	.74	6416.20	545	300	300		77	115		2.0
7		.12	.74	6418.03	555	290	285		78	117		2.0
8		.05	.30	6419.25	490	290	285		78	117		<2.0
Port #3 1		.11	.67	6420.98	520	295	280		88	118		2.0
2		.12	.74	6422.82	520	240	290		80	118		2.0
3		.09	.55	6424.48	520	280	280		75	118		<2.0
4		.10	.61	6426.21	525	280	285		76	118		<2.0
5		.09	.55	6427.72	520	300	300		78	118		<2.0
6		.075	.46	6429.28	510	290	290		80	118		<2.0
7		.075	.46	6430.68	520	300	300		78	118		<2.0
8		.045	.27	6431.783	485	290	310		75	119		<2.0
Average		.123	.751	43.885	524							

6387.898

.837-.92"H₂O 30.26

	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	122	-	100	=	22
#2	108	-	100	=	8
#3	0	-	0	=	—
				Total	30
#4	210.4	-	200	=	10.4
				Total Vol. H₂O	40.4

pH - 6.2

#1 2.5 ft
#2 2.5 ft

PARTICULATE

DATA

V_{H_2O} = 2.005
V_{DSCF} = 46.90
4.1 % moisture

Sampling Time Per Point, Min
3

Before
After

Leak Check Rate
Vac in. Hg ft³/min

ISOKINETICS = 106.

TEST NUMBER 12
DATE 11-6-79
OPERATOR MJ
FUEL UNWASHED
SITE K
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #3 1		.36	.42	255.76	380	260	230			70		3.0
2		.52	.63	257.71	390	275	230			70		3.7
3		.62	.74	260.21	390	270	240			72		4.1
4		.62	.74	262.29	395	270	245			75		4.1
5		.58	.70	264.32	395	275	250			75		3.9
6		.55	.66	266.29	395	275	250			75		3.7
7		.52	.63	268.21	390	270	245			80		3.5
8		.40	.48	269.87	360	270	245			80		3.0
PORT #2 1		.60	.72	271.93	395	220	180			80		4.0
2		.66	.80	274.09	400	245	210			80		4.3
3		.70	.85	276.39	400	265	215			80		4.5
4		.66	.80	278.42	400	270	225			80		4.3
5		.38	.46	280.02	395	265	220			80		3.0
6		.36	.43	281.56	380	255	215			85		2.8
7		.30	.36	283.06	380	250	210			82		2.3
8		.36	.43	284.66	340	255	220			82		3.8
PORT #1 1		.50	.60	286.52	395	200	180			80		3.2
2		.50	.60	288.42	395	230	180			82		3.4
3		.60	.72	290.46	400	240	175			80		4.0
4		.62	.74	292.52	400	250	195			80		4.2
5		.60	.72	294.55	400	245	175			80		4.0
6		.55	.66	296.50	400	260	180			75		3.8
7		.58	.70	298.54	400	240	170			75		4.0
8		.50	.60	300.42	375	250	160			75		3.6
Average		.53	.63	—	390	—	—	—		78		

METER VOL. END
START 254.16
SAMPLE VOL. 46.26 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	+1.0" H_2O	30.26

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	126	-	100	=	26
#2	108	-	100	=	8
#3	0	-	0	=	0
				Total	34
#4	g(End)		g(Start)		Δgrams
Silica Gel	208.3	-	200.0	=	8.3
				Total Vol. H_2O	42.3 ml

SHORT – pH – 6.2
1 – 2.5
2 – 2.5

73

PARTICULATE

DATA

19.8

TEST NUMBER 13
DATE 11-7-79
OPERATOR R.A.P
FUEL ALA. UNWASHED
SITE K
PROBE LOCATION BLR OUT

3.0

Before
After

Sample Point	Time	METER CONDITIONS △Ps	 △H	 Meter Reading	TEMPERATURES, °F Stack	 Probe	 Oven	Impingers In	 Out	 Meter	O2,%	Vac.
PORT #1 1	9:13	.11	.67	6438.96	520	240	240		82	88		<2.0
2		.10	.61	6440.68	520	250	240		73	92		<2.0
3		.09	.55	6442.43	520	290	250		72	93		<2.0
4		.095	.58	6444.25	510	300	270		72	97		<2.0
5		.085	.52	6445.78	510	360	275		72	98		<2.0
6		.07	.43	6447.31	510	290	280		72	99		<2.0
7		.09	.55	6448.64	515	290	285		72	101		<2.0
8		.045	.28	6450.03	490	280	285		72	102		<2.0
PORT #2 1		.155	.95	6452.19	540	—	295		82	102		2.2
2		.12	.74	6454.03	535	240	300		78	105		2.0
3		.14	.85	6456.05	540	280	295		72	104		2.1
4		.15	.92	6458.13	545	295	290		75	109		2.2
5		.14	.85	6460.24	555	305	305		72	110		2.1
6		.13	.80	6462.37	555	300	300		70	110		2.0
7		.12	.74	6463.96	555	300	305		71	111		2.0
8		.09	.55	6465.58	520	295	295		71	112		<2.0
PORT #3 1		.20	1.22	6467.95	540	220	290		72	112		2.7
2		.18	1.10	6470.24	550	230	360		72	112		2.5
3		.21	1.30	6472.58	560	275	295		71	112		2.8
4		.21	1.30	6475.02	560	305	300		71	112		2.8
5		.20	1.22	6477.40	570	310	300		71	114		2.7
6		.16	.98	6479.48	575	305	300		71	—		2.3
7		.14	.85	6481.45	560	295	300		71	115		2.2
8		.15	.92	6483.49	520	295	—		71	116		2.2
Average		.133	.812		536							

6483.492
6437.135
46.357

.837 - .98" H2O 30.35

.378

	Vol. (End)		Vol. (Start)		Vol. (ml)
#1	128	-	100	=	28
#2	103	-	100	=	13
#3	1	-	0	=	1
				Total	40
#4	208.1	-	200	=	8.1
				Total Vol. H_2O	48.1 ml

Fh #1 2.5"
" #2 " 3.2

PARTICULATE

DATA

Leak Check Rate
Vac
in. Hg ft³/min

ISOKINETICS = 98.1

TEST NUMBER 13
DATE
OPERATOR mJ
FUEL unwashed
SITE 15
PROBE LOCATION Stack

Sampling Time Per Point, Min
3

Before

After

4306.22

	Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
			ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port 1	1	3	.44	.46	307.88	400	230	125	120		65		2.2
	2	3	.54	.57	309.72	400	220	122	150		65		3.0
	3	3	.58	.58	311.64	400	245	140	160		78		3.2
	4	3	.64	.68	313.59	400	245	130	165		70		3.4
	5	3	.58	.68	315.53	400	250	130	160		65		3.2
	6	3	.56	.58	317.49	395	240	125	145		70		3.2
	7	3	.54	.57	319.32	400	245	140	165		70		2.9
	8	3	.50	.52	321.08	375	235	140	175		75		2.9
Port 2	1	3	.44	.46	322.62	400	205	140	130		70		2.4
	2	3	.64	.68	324.54	395	230	155	155		75		3.0
	3	3	.72	.75	326.40	405	250	150	150		72		3.7
	4	3	.72	.75	328.67	395	250	160	170		75		3.7
	5	3	.68	.72	330.68	400	250	170	180		80		3.7
	6	3	.60	.64	332.60	400	245	180	180		80		3.0
	7	3	.56	.58	334.42	400	265	200	195		80		2.9
	8	3	.54	.57	336.22	355	265	200	195		85		2.8
Port 3	1	3	.60	.64	338.13	400	195	195	170		82		3.0
	2	3	.70	.74	340.16	405	220	190	190		85		3.6
	3	3	.76	.80	342.28	405	245	215	195		85		4.0
	4	3	.76	.80	344.38	410	250	200	205		90		4.0
	5	3	.74	.77	346.44	410	255	190	195		85		3.8
	6	3	.54	.57	348.20	405	245	185	190		87		2.9
	7	3	.64	.67	350.11	400	250	190	190		82		3.0
	8		.60	.64	351.95	370	240	190	195		87		3.2
	Average		.61	.643	45.73	857R					77.1		

METER VOL. (End) 351.95
(Start) 306.22
Sample Vol. 45.73

1.75

.817	+1.4 H₂O	30.35

Nomograph Setup

T_{meter} = C =
T_{stack} = T_{stack} =
T_{meter} = ΔH =
ΔH@ =
% H₂O =

Imp.	Vol.(End)		Vol.(Start)		Vol.(ml)
#1	127	-	100	=	29
#2	108	-	100	=	8
#3	C	-	0	=	—
				Total	37
#4 Silica	g(End) 209.1	-	g(Start) 200	=	9.1
			Total Vol. H₂O		46.1

PH 1 = 2.5
2 = 3.0

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PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

Sampling Time Per Point, Min
3.0

ISOKINETICS = 102.5

TEST NUMBER 14
DATE 11-7-79
OPERATOR RAP
FUEL ALA.-[illegible]
SITE K
PROBE LOCATION BRONT

% moisture - 6.1%

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #3 1	13:33	.17	1.02	6526.46	575	240	240		80	101		2.2
2		.15	.92	6528.53	580	300	245		75	—		2.0
3		.21	1.30	6530.98	590	330	245		72	103		2.5
4		.225	1.40	6533.51	600	330	250		70	103		2.8
5		.215	1.30	6535.91	595	325	250		70	—		2.5
6		.17	1.02	6538.11	590	320	255		68	103		2.2
7		.16	.98	6540.23	595	300	275		70	108		2.1
8		.15	.92	6542.28	550	295	300		69	—		2.1
PORT #2 1		.185	1.15	6544.53	560	220	310		78	112		2.3
2		.14	.85	6546.50	575	240	320		72	112		2.1
3		.16	.98	6548.58	595	290	320		72	—		2.2
4		.16	.98	6550.65	605	310	310		72	114		2.2
5		.155	.95	6552.71	600	310	320		73	116		2.1
6		.14	.85	6554.68	595	310	310		73	118		2.0
7		.13	.80	6556.58	580	300	320		72	118		2.0
8		.09	.55	6558.23	530	300	300		72	118		<2.0
PORT 1 1		.15	.92	6560.208	560	—	320		78	120		2.2
2												
3												
4		— CONVEYING SYSTEM DOWN - TEST TERMINATED										
5												
6												
7												
8												
Average		.16	.99	36.098	580							

METER VOL. END 6560.208
START 6524.190
SAMPLE VOL. ft³

Cpitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.97" H₂O	30.25

Percent O₂ =

Nomograph Setup

Pmeter =
Pstack =
Tmeter =
ΔHg =
% H₂O =
C =
Tstack =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	132	-	160	=	32
#2	109	-	160	=	9
#3	1	-	0	=	1
				Total	42
#4	g(End)		g(Start)		Δgrams
Silica Gel	207.8	-	200	=	7.8
				Total Vol. H₂O	49.8 ml

pH — #1 — 2.5
" — #2 — 2.5

PARTICULATE

DATA

Leak Check Rate
Vac
in. Hg ft³/min

Sampling Time Per Point, Min
3

Before
After

5/minute

ISOKINETICS = 103.7

TEST NUMBER 14
DATE 11-7-79
OPERATOR MJ
FUEL [illegible]
SITE K
PROBE LOCATION Stack

4359.14

	Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
			ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port # 3	1	3	.58	.61	361.06	410	260	210	150		65		2.2
	2	3	.64	.68	363.07	415	250	170	170		65		7.8
	3	3	.72	.76	365.23	415	245	190	185		60		4.1
	4	3	.72	.76	367.34	418	255	200	180		65		4.0
	5	3	.70	.73	369.42	415	260	190	190		63		4.0
	6	3	.64	.68	371.41	415	250	180	190		70		3.8
	7	3	.60	.63	373.34	415	250	190	180		65		3.5
	8	3	.56	.59	375.19	380	240	185	180		72		3.2
Port # 2	1	3	.54	.57	377.01	415	190	160	140		72		3.2
	2	3	.64	.68	378.99	420	230	180	165		72		3.8
	3	3	.70	.73	381.07	420	250	200	180		65		4.0
	4	3	.70	.73	383.13	410	250	205	180		75		4.0
	5	3	.66	.70	385.15	420	260	215	180		65		4.0
	6	3	.58	.61	387.00	418	270	205	200		75		3.5
	7	3	.56	.59	388.77	415	260	200	185		77		3.2
	8	3	.50	.53	390.52	385	260	210	195		80		2.9
Port # 1	1	3	.50	.53	392.34	400	220	160	130		75		2.9
	2												
	3				Conveying System Down								
	4				Test Terminated								
	5												
	6												
	7												
	8												
	Average		.62	.654	33.2	411					69.5		

METER VOL. END 392.34
START 359.14
SAMPLE VOL. 33.2 ft³

[illegible]	[illegible]	[illegible]
.817	1.3	30.25

Percent O₂ =

P meter = C =
P stack = T stack =
T meter =

PH -2.5 1+2

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	129	-	100	=	29
#2	105	-	100	=	5
#3	—	-	0	=	
				Total	34

#4	g (End)		g (Start)		Δgrams
Silica gel	206.7	-	200	=	6.7
			Total Vol. H₂O		40.7 ml

PARTICULATE

DATA

V_{H_2O} = 2.56
V_{std} = 42.3
5.7 % moisture

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = ______ %

TEST NUMBER 15
DATE 11-8-79
OPERATOR R.AP
FUEL ALA. CRUSHED
SITE K
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #1 1	11:25	.10	.62	6568.99	525	250	330		98	102		<2.0
2		.105	.65	6570.75	525	265	330		75	102		<2.0
3		.10	.62	6572.50	520	285	330		75	—		<2.0
4		.135	.83	6574.51	515	290	320		72	108		2.2
5		.11	.67	6576.34	520	285	315		72	—		2.0
6		.06	.37	6577.57	520	290	325		72	—		<2.0
7		.06	.37	6578.87	515	285	325		70	—		<2.0
8		.03	.185	6579.76	490	285	310		68	108		<2.0
PORT #2 1		.175	1.08	6582.03	530	—	300		80	—		2.5
2		.15	.92	6584.14	535	255	300		68	—		2.3
3		.10	.62	6585.76	540	300	290		68	—		2.0
4		.10	.62	6587.49	545	320	290		68	—		<2.0
5		.09	.55	6589.07	550	320	295		70	—		<2.0
6		.10	.62	6590.71	555	295	285		70	—		<2.0
7		.10	.62	6592.45	555	310	305		70	—		<2.0
8		.09	.55	6594.98	525	300	310		70	—		<2.0
PORT #3 1		.11	.67	6595.71	535	220	270		68			<2.0
2		.09	.55	6597.37	535	230	275		72			<2.0
3		.12	.74	—	545	275	280		72			2.0
4		.14	.85	6601.65	560	290	270		72			2.2
5		.14	.85	6603.61	560	310	270		73			2.2
6		.115	.70	6605.47	560	305	270		73			2.0
7		.125	.78	6607.32	560	300	275		—			2.0
8		.11	.67	6608.983	480	290	270		73			2.0
Average	.106	.654	42.055	533		—	—	—	—	—	—	

Nomograph Setup

METER VOL. END
START 6566.928
SAMPLE VOL. ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.92" H$_2$O	30.04

Percent O$_2$ =

P$_{meter}$ =
P$_{stack}$ =
T$_{meter}$ =
ΔH$_g$ =
% H$_2$O =

C =
T$_{stack}$ =
ΔP =
Noz(Ideal)=
Noz(Actual)= .378

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	135.5	-	100	=	35.5
#2	110	-	100	=	10
#3	0	-	0	=	0
				Total	45.5
#4	g(End)		g(Start)		Δgrams
Silica Gel	208.5	-	200	=	8.5
				Total Vol. H$_2$O	54.0 ml

Imp. 1 — 2.2 pH start pH 5.5
2 — 2.5

PARTICULATE

DATA

V_{H_2O} = 2.100
V_{DSCF} = 36.557
5.4% moisture

Sampling Time Per Point, Min: 3.0

Leak Check Rate
Vac in. Hg ft^3/min
Before
After

ISOKINETICS = 91.8%

TEST NUMBER 15
DATE 11-8-79
OPERATOR MJ
FUEL ALA - CRUSHED
SITE K
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2,%	Vac.
Port #1 1		.36	.38	399.25	385	290	320			75		2.0
2		.40	.42	401.80	380	286	320			75		2.2
3		.34	.35	402.31	380	280	320			75		2.2
4		.34	.35	403.74	385	285	320			80		2.3
5		.30	.32	405.21	380	290	320			80		2.0
6		.36	.38	406.65	380	285	330			80		2.3
7		.46	.48	408.33	390	290	320			82		3.0
8		.36	.38	409.89	365	295	315			85		2.3
Port #2 1		.34	.35	411.26	390	240	285			87		2.1
2		.38	.40	412.73	380	265	295			80		2.5
3		.50	.52	414.45	385	270	300			85		3.0
4		.56	.59	416.21	395	290	305			90		3.2
5		.60	.62	418.11	400	295	305			95		3.5
6		.50	.52	419.77	395	290	300			95		3.0
7		.44	.46	421.36	390	300	310			95		2.9
8		.40	.42	422.83	365	305	315			95		2.0
Port #3 1		.34	.35	424.27	380	245	240			98		2.3
2		.44	.46	425.89	385	260	255			98		2.9
3		.42	.44	427.34	385	270	250			98		2.5
4		.50	.52	428.85	385	270	245			98		3.0
5		.50	.52	430.41	390	280	250			98		3.0
6		.52	.54	431.98	395	285	240			98		3.0
7		.46	.48	433.53	390	270	245			98		2.9
8		.40	.42	435.08	355	270	240			98		2.7
Average		.43	.44	36.34	384					89		

METER VOL. END
START 4398.74
SAMPLE VOL. ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	+.8" H_2O	30.04

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O = 5.4

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= 3.354 x 10^{-4}

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	130	-	100	=	30
#2	107	-	100	=	7
#3	0	-	0	=	0
				Total	37
#4	g(End)		g(Start)		Δgrams
Silica Gel	207.3	-	200	=	7.3

Total Vol. H_2O 44.3 ml

PARTICULATE

DATA

Leak Check Rate
Vac
in. Hg   ft^3/min
Before
After

Sampling Time Per Point, Min
3.0

ISOKINETICS = 102.3

TEST NUMBER 16
DATE 11-9-79
OPERATOR R.AP
FUEL ALA-CRUSHED
SITE K
PROBE LOCATION EXIT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port #3 1	11:17	.12	.71	6614.88	555	260	285		88	—		<2.0
2		.12	.71	6616.73	550	320	285		73	105		<2.0
3		.155	.92	6618.80	565	300	270		72	105		2.2
4		.185	1.10	6621.11	600	300	300		72	—		2.5
5		.17	1.0	6623.40	600	300	315		—	—		2.4
6		.12	.71	6625.21	595	305	315		73	—		2.0
7		.11	.65	6626.88	595	305	320		73	106		2.0
8		.09	.54	6628.49	540	275	305		72	110		<2.0
Port #2 1		.10	.58	6630.15	560	—	305		78	—		2.0
2		.13	.78	6631.98	570	220	305		78	118		2.2
3		.105	.62	6633.65	565	270	315		—	125		2.0
4		.12	.71	6635.49	570	295	300		80	—		2.1
5		.12	.71	6637.34	580	305	310		75	—		2.2
6		.11	.65	6639.02	590	300	310		73	128		2.0
7		.10	.58	6640.63	575	305	315		73	—		2.0
9		.07	.42	6642.06	535	305	310		73	130		<2.0
Port #4 1		.14	.84	6644.97	565	—	310		82	130		2.2
2		.18	1.10	6646.23	560	230	310		73	—		2.8
3		.09	.54	6647.80	560	220	320		85	125		2.0
4		.12	.71	6649.62	570	270	320		78	—		2.2
5		.10	.58	6651.30	560	300	320		80	128		2.0
6		.09	.54	6652.79	560	275	320		—	128		2.0
7		.07	.42	6654.29	560	290	320		—	131		2.0
8		.03	.18	6655.128	515	290	—		—	—		<2.0
Average		.11	.68	42.110	566							

METER VOL. END
START 6613.018
SAMPLE VOL. ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-1.0"H_2O	29.66

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) = .378
=

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	152	-	100	=	52
#2	112	-	100	=	12
#3		-	0	=	
				Total	
#4	g(End)		g(Start)		Δgrams
Silica Gel	210.5	-	200	=	10.5
				Total Vol. H_2O	74.5 ml

St. Ph. 5.5
#1 1.9
#2 2.5

PARTICULATE

DATA

V_{H_2O} = 3.218
V_{DSCF} = 39.489
7.5% H_2O

Sampling Time Per Point, Min
3.0

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 99.5

TEST NUMBER 16
DATE 11-19-79
OPERATOR MJ
FUEL ALA-CRUSHED
SITE K
PROBE LOCATION MECH OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT 3 1		.48	.50	439.30	400	230	210			80		29
2		.50	.53	441.10	400	250	240			78		30
3		.60	.64	443.01	400	260	250			78		35
4		.60	.64	444.92	410	270	260			78		3:7
5		.56	.60	446.76	400	275	270			78		3.5
6		.50	.52	448.51	400	275	275			80		3.2
7		.46	.48	450.21	400	270	280			80		3.0
8		.42	.44	451.72	380	270	280			80		3.0
PORT 2 1		.60	.64	453.66	410	250	265			82		4.0
2		.58	.62	455.54	410	265	270			85		3.8
3		.52	.55	457.34	405	280	280			85		3.5
4		.48	.51	459.04	400	290	290			85		3.2
5		.34	.36	460.46	395	295	290			88		2.5
6		.40	.42	462.00	395	300	300			90		3.0
7		.40	.42	463.51	395	300	305			88		2.9
8		.44	.48	465.17	380	295	305			90		3.0
PORT 1 1		.40	.42	466.63	400	240	280			90		2.8
2		.42	.44	468.25	405	270	290			90		3.0
3		.40	.42	469.71	400	290	290			92		3.0
4		.38	.40	471.24	400	290	300			92		2.9
5		.36	.38	472.65	400	290	310			93		2.9
6		.36	.38	474.16	400	290	310			95		3.0
7		.40	.42	475.63	400	290	310			92		3.0
8		.44	.46	4477.29	370	300	310			95		3.1
Average		.46	.48	—	398	—	—			86		

METER VOL. END 4477.29
START 4437.52
SAMPLE VOL. 39.77 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	+ .66" H_2O	29.66

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	152	100	52
#2	107.5	100	7.5
#3	0	0	0
		Total	
#4	g(End)	g(Start)	Δgrams
Silica Gel	208.4	200	8.4
		Total Vol. H_2O	67.9 ml

START — pH - 5.5
Imp #1 pH - 1.9
#2 pH - 2.5

PARTICULATE

DATA

	17
	11-10-79
OPERATOR	RAP
	ALA. CRUSHED
	K
LOCATION	BLR OUT

Sampling Time 30

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	Stack	Probe	Box	Out	Meter	O_2,%	Vac.
PORT# 1 1	9:07	.07	.41	6656.71	500	280	220	80	95		<2.0
2		,06	.35	6658.11	500	280	220	70	98		<2.0
3		.06	.35	6659.44	490	310	240	70	99		<2.0
4		.05	.30	6660.62	480	310	250	75	99		<2.0
5		,05	.30	6661.83	495	300	260	—	101		<2.0
6		,04	.23	6662.90	490	290	280	—	—		<2.0
7		.04	,23	6664.00	490	280	295	70	110		<2.0
8		.02	,12	6664.70	480	280	310	71	—		<2.0
PORT# 2 1		,08	.47	6666.27	505	220	310	78	117		<2.0
2		,07	,41	6667.63	515	220	310	70	—		<2.0
3		,08	,47	6669.18	515	260	310	68	117		<2.0
4		.09	.54	6670.72	520	265	310	70	120		<2.0
5		.08	.47	6672.30	520	270	320	70	121		<2.0
6		.07	.41	6673.64	520	290	—	—	—		<2.0
7		,06	.35	6674.94	520	270	—	—	122		<2.0
8		.05	,30	6676.19	495	280	300	—	122		<2.0
PORT# 3 1		,10	,58	6677.76	500	—	255	—	125		<2.0
2		.10	,58	6679.46	520	220	260	72	—		<2.0
3		.14	,82	6681.40	520	250	260	70	125		2.0
4		,10	,58	6683.00	525	260	—	—	120		1.9
5		.105	.63	6684.69	520	265	290	70	130		<2.0
6		.11	.64	6686.45	530	280	270	—	—		<2.0
7		.09	.54	6688.98	525	275	270	—	132		<2.0
8		,07	.41	6689.386	495	270	230	—	132		<2.0
Average		.074	.437	34.061	507				116		

6655.325

126	100	26
107	100	7
	0	
		33
206.7	200	6.7
		39.7

.837 - .664 H₂O 2996

.378

START pH — 5.5
1st Imp — 2.2
2nd Imp — 2.5

PARTICULATE

DATA

100.2

TEST NUMBER	17
DATE	11-10-79
OPERATOR	MJ
FUEL	Crushed
SITE	K
PROBE LOCATION	Stack

Sampling Time Per Point, Min
3

Before

After

4489.24

	Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	Stack	Probe	Oven		Out	Meter	O_2,%	Vac.
Port 1	1	3	.20	.21	490.31	360	220	130	110		70		1.9
	2	3	.24	.25	491.60	365	230	130	125		70		2.0
	3	3	.26	.28	492.98	365	230	130	115		70		2.1
	4	3	.26	.28	494.28	370	235	150	140		72		2.0
	5	3	.26	.28	495.59	365	240	135	140		72		2.1
	6	3	.25	.27	496.87	370	235	130	150		75		2.0
	7	3	.26	.28	498.21	370	230	140	150		75		2.1
	8	3	.26	.28	499.53	340	230	145	150		78		2.1
Port 2	1	3	.25	.27	500.81	365	185	130	118		78		2.0
	2	3	.30	.32	502.22	370	200	130	120		78		2.1
	3	3	.34	.36	503.60	370	220	135	140		79		2.8
	4	3	.34	.36	505.17	370	230	140	135		80		2.8
	5	3	.34	.36	506.63	370	230	145	140		80		2.8
	6	3	.30	.32	508.07	365	230	150	145		80		2.4
	7	3	.30	.32	509.45	365	235	155	155		80		2.5
	8	3	.24	.26	510.62	350	235	165	150		81		2.0
Port 3	1	3	.24	.26	511.87	360	200	140	115		82		2.0
	2	3	.30	.32	513.27	370	210	145	125		81		2.4
	3	3	.32	.34	514.67	370	225	150	150		82		2.5
	4	3	.35	.37	516.22	365	230	155	155		82		2.8
	5	3	.38	.40	517.71	365	235	160	170		82		3.0
	6	3	.28	.30	519.67	365	235	160	160		83		2.1
	7	3	.38	.40	520.58	365	235	165	170		85		3.0
	8	3	.32	.34	522.03	350	235	165	175		85		2.8
	Average		.29	.31	32.79	364					78		

522.03
490.31
32.79

.817	+.9" H_2O	29.96

	Vol (End)	Vol (Start)	ΔVol (ml)
	126	100	26
	104	100	4
		Total	30
	206.1	200	6.1
			36.1

Start
5.5

Ph # 1 = 2.2
2 = 2.5

PARTICULATE LAB WORKSHEET

S.te K

TEST NO. 1 (Inlet, Outlet) LOCATION Boiler Out

Date 10/11/79 Box No. ______ Eng. Jim Demont

Test Description Baseline - Full Load (50,000 #/hr) normal O_2 + O.F.A.

Dry Gas Meter Vol (ft^3)

Final 5792.53

Initial 5750.34

Δ DgV 42.19

Impinger Water Vol (ml)

	1	2	3	Total
Final	138	106	204.0	
Initial	100	100	200.0	
Δ Vlc	38	6	4.0	48

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			6	1	1		
DATE WT.			—	—	—		
TARE WT.	1		103.4585	49.6408	}		
	2		103.4585	49.6407			
	3		103.4585	49.6408			
	4		—	—			
AVG.			103.4585	49.6408	.7134		
POST TEST WTS.							
	1		103.6397	50.7590	.8260		
	2		103.6398	50.7589	.8268		
	3		103.6400	50.7573	.8272		
	4		103.6383	—	.8242		
AVG.			103.6395	50.7584	.8242		
Δ WT.			0.1810	1.1176	0.1108		

Δ Vlc = 48.0 ml

Δ DgV = 42.19 ft^3

Δ Mn 1409.4 mgm

LOAD 48.708 klb/hr

O_2 8.7 %

REMARKS: ______

PARTICULATE LAB WORKSHEET

Site K

TEST NO. 1 (Inlet, Outlet) LOCATION Stack

Date 10/11/79 Box No. ______ Eng. Russ Parker

Test Description Baseline - Full Load (50,000 #/hr) normal O_2 + O.F.A.

Dry Gas Meter Vol (ft^3)

Final 3830.802

Initial 3783.273

Δ DgV 47.529

Impinger Water Vol (ml)

	1	2	3 Drierite	Total
Final	133	116	212.0	
Initial	100	100	200.0	
Δ Vlc	33	16	12.0	61

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			7		2		
DATE WT.			—		—		
TARE WT.	1		100.6154				
	2		100.6161				
	3		100.6162				
	4		—				
AVG.			100.6159		.5930		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		100.7301		.7360		
	2		100.7299		.7369		
	3		100.7304		.7374		
	4		100.7283		—		
AVG.			100.7297		.7368		
Δ WT.			0.1138		0.1438		

Δ Vlc = 61.0 ml

Δ DgV = 47.529 ft^3

Δ Mn 257.6 mgm

LOAD 48.708 klb/hr

O_2 8.9 %

REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

Site K

TEST NO. 2 (Inlet, Outlet) LOCATION Boiler Out

Date 10/13/79 Box No. ______ Eng. Jim Demont

Test Description Base line (½ Full Load (25,000#/hr) normal O_2 + OFA

Dry Gas Meter Vol (ft^3)

Final 5831.26

Initial 5797.60

Δ DgV 33.66

Impinger Water Vol (ml)

	1	2	Dri Rite	Total
Final	118	109	202.0	
Initial	100	100	200.0	
Δ Vlc	18	9	2.0	29

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			8	2	5		
DATE WT.			—	—	—		
TARE WT.	1		104.3626	50.2973			
	2		104.3627	50.2970			
	3		104.3623	50.2970			
	4		—	—			
AVG.			104.3625	50.2971	.7329		
POST TEST WTS.							
	1		104.4564	50.5688	.7765		
	2		104.4566	50.5689	.7792		
	3		104.4568	50.5675	.7782		
	4		104.4543	—	.7770		
AVG.			104.4543	50.5684	.7770		
Δ WT.			0.0918	0.2713	0.0441		

Δ Vlc = 29.0 ml

Δ DgV = 33.66 ft^3

Δ Mn 407.2 mgm

LOAD 24.968 klb/hr

O_2 13.6 %

REMARKS: ______

PARTICULATE LAB WORKSHEET

Stack

TEST NO. 2 (Inlet, Outlet) LOCATION Stack

Date 10/13/79 Box No. ______ Eng. Elden Smith

Test Description Baseline – ½ Full Load (25,000#/hr) normal O_2 + O.F.A.

Dry Gas Meter Vol (ft^3)

Final 3874.41

Initial 3836.77

Δ DgV 37.64

Impinger Water Vol (ml)

	1	2	Dri-Rite	Total
Final	120	104	201.5	
Initial	100	100	200.0	
Δ Vlc	20	4	1.5	25.5

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			9		6		
DATE WT.			—		—		
TARE WT.	1		75.0084				
	2		95.0090				
	3		95.0093				
	4		—				
AVG.			95.0089		.5892		

POST TEST WTS.

	1		95.0614		.6562		
	2		95.0601		.6566		
	3		95.0616		.6572		
	4		95.0581		.6545		
AVG.			95.0581		.6545		
Δ WT.			0.0492		.0653		

Δ Vlc = 25.5 ml

Δ DgV = 37.64 ft^3

Δ Mn 114.5 mgm

LOAD 24.968 klb/hr

O_2 13.8 %

REMARKS: ____________

PARTICULATE LAB WORKSHEET

Site K

TEST NO. 3 (Inlet, Outlet) LOCATION Boiler Out

Date 10/15/79 Box No. ______ Eng. Jim Demont

Test Description Baseline - 3/4 Full Load (37,500 #/hr) - normal O_2 + OFA.

Dry Gas Meter Vol (ft^3)
Final 5875.11
Initial 5837.34
Δ DgV 37.77

Impinger Water Vol (ml)

	1	2	3 Drierite	Total
Final	184	51	266.8	
Initial	100	100	259.0	
Δ Vlc	84	-49	7.8	42.8

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			10	3	3		
DATE WT.			—	—	—		
TARE WT.	1		97.7656	50.8307	.7868		
	2		97.7657	50.8308	.7870		
	3		97.7667	50.8307	.7872		
	4		—	—	—		
AVG.			97.7660	50.8307	.7870		
POST TEST WTS.							
	1		97.8953	51.2916	.8860		
	2		97.8943	51.2918	.8880		
	3		97.8927	51.2917	.8881		
	4		—	51.2904	—		
AVG.			97.8927	51.2904	.8874		
Δ WT.			0.1267	0.4597	0.1004		

Δ Vlc = 42.8 ml LOAD 35.593 klb/hr

Δ DgV = 37.77 ft^3 O_2 10.9 %

Δ Mn 686.8 mgm REMARKS: ________

PARTICULATE LAB WORKSHEET

S.tack

TEST NO. 3 (Inlet, Outlet) LOCATION Stack

Date 10/15/79 Box No. ______ Eng. Elden Smith

Test Description Baseline - 3/4 Full Load (37,500 #/hr) - normal O_2 + OFA.

Dry Gas Meter Vol (ft^3)

Final 3910.27

Initial 3874.55

Δ DgV 35.72

Impinger Water Vol (ml)

	1	2	3	Total
Final	125	105	258.6	
Initial	100	100	248.0	
Δ Vlc	25	5	10.6	41.6

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			11		4		
DATE WT.			—		—		
TARE WT.	1		95.9768		.5861		
	2		95.9763		.5861		
	3		95.9771		.5862		
	4		—		—		
AVG.			95.9767		.5861		
POST TEST WTS.							
	1		96.0637		.6819		
	2		96.0636		.6827		
	3		96.0638		.6839		
	4		96.0621		—		
AVG.			96.0621		.6828		
Δ WT.			0.0854		.0967		

Δ Vlc = 41.6 ml

Δ DgV = 35.72 ft^3

Δ Mn 182.1 mgm

LOAD 35.593 klb/hr

O_2 10.95 %

REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

s.kK

TEST NO. 4 (Inlet, Outlet) LOCATION Boiler Out

Date 10/16/79 Box No. ______ Eng. Jim Demont

Test Description Full Load (50,000#/hr) Hi O_2 Lo OFA (2.5" H_2O)

Dry Gas Meter Vol (ft^3)

Final 5920.49

Initial 5878.65

Δ DgV 41.84

Impinger Water Vol (ml)

	1	2	Drizite	Total
Final	148	110	216.0	
Initial	100	100	209.0	
Δ Vlc	48	10	7.0	65

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			12	5	7		
DATE WT.			—	—	—		
TARE WT.	1		97.0253	105.2113	.7121		
	2		97.0246	105.2113	.7120		
	3		97.0252	105.2114	.7121		
	4		—	—			
AVG.			97.0250	105.2113	.7121		

POST TEST WTS.

	1		97.1592	105.8986	.8038		
	2		97.1588	105.8975	.8030		
	3		97.1584	105.8962	.8030		
	4		—	—	—		
AVG.			97.1588	105.8962	.8033		
Δ WT.			0.1338	0.6849	0.0912		

Δ Vlc = 65.0 ml

Δ DgV = 41.84 ft^3

Δ Mn 909.9 mgm

LOAD 49.75 klb/hr

O_2 8.2 %

REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

Stack

TEST NO. 4 (Inlet, Outlet) LOCATION Stack

Date 10/16/79 Box No. ______ Eng. Elden Smith

Test Description Full Load (50,000#/hr) Hi O_2 Lo OFA (2.5" H_2O)

Dry Gas Meter Vol (ft^3)
Final 3956.04
Initial 3910.40
Δ DgV 45.64

Impinger Water Vol (ml)

	1	2	Drierite	Total
Final	148	108	215.5	
Initial	100	100	207.8	
Δ Vlc	48	8	10.7	66.7

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			13		8		
DATE WT.			—		—		
TARE WT.	1		—		.5831		
	2		100.1779		5830		
	3		100.1774		5830		
	4		100.1775				
AVG.			100.1776		.5830		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		100.2686		.6916		
	2		100.2689		.6884		
	3		100.2693		.6875		
	4		—		—		
AVG.			100.2689		.6875		
Δ WT.			0.0913		0.1045		

Δ Vlc = 66.7 ml
Δ DgV = 45.64 ft^3
Δ Mn 195.8 mgm

LOAD 49.75 klb/hr
O_2 8.1 %
REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

S.teK

TEST NO. S (Inlet, Outlet) LOCATION Boiler Out

Date 10/24 Box No. ______ Eng. Russ Parker

Test Description Full Load (50,000 #/hr) Lo O_2 Lo OFA (2.5" H_2O)

Dry Gas Meter Vol (ft^3)
Final 5964.880
Initial 5924.756
Δ DgV 40.124

Impinger Water Vol (ml)

	1	2	Dr.rite	Total
Final	136	115	200.2	
Initial	100	100	190.0	
Δ Vlc	36	15	10.2	61.2

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			14	19	9		
DATE WT.			—	—	—		
TARE WT.	1		99.6643	50.8298	.7938		
	2		99.6642	50.8306	.7939		
	3		99.6640	50.8303	.7938		
	4		—	—	—		
AVG.			99.6642	50.8302	.7938		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		99.8609	51.4804	.8761		
	2		99.8608	51.4807	.8762		
	3		99.8606	51.4808	.8760		
	4		—	—	—		
AVG.			99.8608	51.4806	.8761		
Δ WT.			0.1966	0.6504	0.0823		

Δ Vlc = 61.2 ml

Δ DgV = 40.124 ft^3

Δ Mn 929.3 mgm

LOAD 47.75 klb/hr

O_2 7.5 %

REMARKS: __________

PARTICULATE LAB WORKSHEET

stack

TEST NO. 5 (Inlet, Outlet) LOCATION Stack

Date 10/24 Box No. ______ Eng. Eldon Smith

Test Description Full Load (50,000 #/hr) Lo O_2 Lo O.F.A (2.5" H_2O)

Dry Gas Meter Vol (ft^3)

Final 4000.15

Initial 3956.07

Δ DgV 44.08

Impinger Water Vol (ml)

	1	2	Dri-rite	Total
Final	128	112	185.4	
Initial	100	100	172.7	
Δ Vlc	28	12	12.7	52.7

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			15		10		
DATE WT.			—		—		
TARE WT.	1		105.2091		.5858		
	2		105.2113		.5860		
	3		105.2102		.5859		
	4		—		—		
AVG.			105.2102		.5859		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		105.3107		.6781		
	2		105.3105		.6781		
	3		105.3105		.6785		
	4		—		—		
AVG.			105.3106		.6782		
Δ WT.			0.1004		0.0923		

Δ Vlc = 52.7 ml

Δ DgV = 44.08 ft^3

Δ Mn 1927 mgm

LOAD 47.75 klb/hr

O_2 8.8 %

REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

Site K

TEST NO. 6 (Inlet, Outlet) LOCATION Boiler Out
Date 10/24 Box No. ______ Eng. Russ Parker
Test Description Full Load (50,000#/hr) Hi OFA (7.5" H_2O)

Dry Gas Meter Vol (ft^3)
Final 6007.288
Initial 5965.100
Δ DgV 42.188

Impinger Water Vol (ml)

	1	2	Dr. Btl.	Total
Final	146	108	226.0	
Initial	100	100	217.5	
Δ Vlc	46	8	8.5	62.5

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			16	21	11		
DATE WT.			—	—	—		
TARE WT.	1		97.7654	50.3257	.7926		
	2		97.7649	50.3269	.7935		
	3		97.7667	50.3262	.7934		
	4		—	—	—		
AVG.			97.7657	50.3263	.7932		
POST TEST WTS.							
	1		97.9028	50.8789	.8826		
	2		97.9028	50.8785	.8826		
	3		97.9030	50.8781	.8827		
	4		—	—	—		
AVG.			97.9029	50.8785	.8826		
Δ WT.			0.1372	0.5622	0.0894		

Δ Vlc = 62.5 ml
Δ DgV = 42.188 ft^3
Δ Mn 778.8 mgm

LOAD 47.45 klb/hr
O_2 8.3 %
REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

Stack

TEST NO. 6 (Inlet, Outlet) LOCATION Stack

Date 10/24 Box No. ______ Eng. Elden Smith

Test Description Full Load (50,000 #/hr) Hi OFA. (7.5" H_2O)

Dry Gas Meter Vol (ft^3)
Final 4045.48
Initial 4000.15
Δ DgV 45.33

Impinger Water Vol (ml)

	1	2	Drierite	Total
Final	138	108	203.4	
Initial	100	100	191.8	
Δ Vlc	38	8	11.6	57.6

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			17		12		
DATE WT.			—		—		
TARE WT.	1		104.3596		.6295		
	2		104.3601		.6300		
	3		104.3604		.6299		
	4		—		—		
AVG.			104.3600		.6298		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		104.4263		.7207		
	2		104.4260		.7205		
	3		104.4276		.7206		
	4		—		—		
AVG.			104.4266		.7206		
Δ WT.			0.0666		0.0908		

Δ Vlc = 57.6 ml LOAD 47.45 klb/hr
Δ DgV = 45.33 ft^3 O_2 9.3 %
Δ Mn 157.4 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

Site K

TEST NO. 7 (Inlet, Outlet) LOCATION Boiler Out

Date 10/25 Box No.______ Eng. Russ Parker

Test Description Full Load (50,000 #/hr) 8.0% O_2, 5" H_2O OFA.

Dry Gas Meter Vol (ft^3)

Final 6058.125

Initial 6014.917

Δ DgV 43.208

Impinger Water Vol (ml)

	1	2	3 Drierite	Total
Final	141	110	230.3	
Initial	100	100	221.1	
Δ Vlc	41	10	9.2	60.2

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			18	22	13		
DATE WT.			—	—	—		
TARE WT.	1		97.0241	50.2958	.7444		
	2		97.0261	50.2958	.7441		
	3		97.0252	50.2960	.7441		
	4		—	—	—		
AVG.			97.0250	50.2959	.7442		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		97.1563	51.1821	.8456		
	2		97.1557	51.1811	.8454		
	3		97.1556	51.1826	.8457		
	4		—	—	—		
AVG.			97.1559	51.1819	.8457		
Δ WT.			0.1809	0.8860	0.1015		

Δ Vlc = 60.2 ml LOAD 50.25 klb/hr

Δ DgV = 43.208 ft^3 O_2 7.2 %

Δ Mn 1118.4 mgm REMARKS:__________

8830-5 rev.

PARTICULATE LAB WORKSHEET

Site K

TEST NO. 7 (Inlet, Outlet) LOCATION Stack

Date 10/25 Box No. ______ Eng. Elden Smith

Test Description Full Load (50,000#/hr) 8.0% O_2 5" H_2O OFA.

Dry Gas Meter Vol (ft^3)

Final 4090.95

Initial 4045.50

Δ DgV 45.45

Impinger Water Vol (ml)

	1	2	Drierite	Total
Final	139	108	225.9	
Initial	100	100	215.9	
Δ Vlc	39	8	10.0	57

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			20		14		
DATE WT.			—		—		
TARE WT.	1		100.6145		.6321		
	2		100.6159		.6319		
	3		100.6142		.6318		
	4		—		—		
AVG.			100.6149		.6319		

POST TEST WTS.

	1		100.6576		.7552		
	2		100.6583		.7554		
	3		100.6581		.7546		
	4		—		—		
AVG.			100.6580		.7551		
Δ WT.			0.0431		0.1232		

Δ Vlc = 57.0 ml LOAD 50.25 klb/hr

Δ DgV = 45.45 ft^3 O_2 8.05 %

Δ Mn 166.3 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

S.K K

TEST NO. 8 (Inlet, Outlet) LOCATION Boiler Out

Date 10/26 Box No. ______ Eng. Russ Parker

Test Description 100% Load (50,000 #/hr) Opt. O_2 (7.0%) Opt O.F.A. (5.0" H_2O)

Dry Gas Meter Vol (ft^3)
Final 6172.678
Initial 6129.495
Δ DgV 43.183

Impinger Water Vol (ml)

	1	2	Drierite	Total
Final	144	118	221.9	
Initial	100	100	211.4	
Δ Vlc	44	12	10.5	66.5

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			24	25	15		
DATE WT.			—	—	—		
TARE WT.	1		103.4584	95.0094	.8006		
	2		103.4602	95.0104	.8001		
	3		103.4568	95.0081	.8002		
	4		—	—	—		
AVG.			103.4585	95.0093	.8003		

POST TEST WTS.

	1		103.5649	95.6552	.8967		
	2		103.5624	95.6552	.8957		
	3		103.5623	95.6557	.8974		
	4		—	—	—		
AVG.			103.5632	95.6554	.8966		
Δ WT.			0.1047	0.6461	0.0963		

Δ Vlc = 66.5 ml LOAD 50.0 klb/hr

Δ DgV = 43.183 ft^3 O_2 7.3 %

Δ Mn 847.1 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

Stack

TEST NO. 8 (Inlet, Outlet) LOCATION Stack

Date 10/26 Box No. ______ Eng. Elden Smith

Test Description 100% Load (50,000 #/hr) Opt O_2 (7.0%) Opt. O.F.A. (5.0" H_2O)

Dry Gas Meter Vol (ft^3)

Final 4134.67

Initial 4091.03

Δ DgV 43.64

Impinger Water Vol (ml)

	1	2	Dririte	Total
Final	142	111	220.5	
Initial	100	100	210.5	
Δ Vlc	42	11	10.0	63.0

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			26		16		
DATE WT.			—		—		
TARE WT.	1		95.9782		.5790		
	2		95.9782		.5790		
	3		95.9777		.5789		
	4		—		—		
AVG.			95.9780		.5790		
POST TEST WTS.							
	1		96.0155		~~.6874~~		
	2		96.0163		~~.6884~~		
	3		96.0165		.6848		
	4		—		.6860		
AVG.			96.0161		.6854		
Δ WT.			0.0381		0.1064		

Δ Vlc = 630 ml

Δ DgV = 43.64 ft^3

Δ Mn 144.5 mgm

LOAD 50.0 klb/hr

O_2 7.8 %

REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 9 BLR OUT (Inlet, Outlet) LOCATION Site K
Date ______ Box No. ______ Eng. ______
Test Description ______

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			27	28	17		
DATE WT.			—	—	—		
TARE WT.	1		104.3618	50.2967	.7931		
	2		104.3615	50.2964	.7932		
	3		104.3615	50.2965	.7929		
	4		—	—	—		
AVG.			104.3616	50.2965	.7931		

POST TEST WTS.

	1		~~104.4742~~	50.3977	.~~8542~~		
	2		~~104.4741~~	50.3970	.8532		
	3		104.4724	50.3961	.8549		
	4		104.4721	—	.8550		
AVG.			~~104.47~~23	50.3969	.8541		
Δ WT.			0.1108	0.1004	0.0613		

Δ Vlc = ______ ml LOAD ______ klb/hr
Δ DgV = ______ ft^3 O_2 ______ %
Δ Mn 272.5 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. TEST #9 — MECH OUT (I~~nlet, Outlet~~) LOCATION K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			29		18		
DATE WT.			—		—		
TARE WT.	1		99.6644		.6368		
	2		99.6645		.6369		
	3		99.6650		.6370		
	4		—		—		
AVG.			99.6646		.6369		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		99.6863		~~.6929~~		
	2		99.6857		.6887		
	3		99.6863		.6898		
	4		—		.6901		
AVG.			99.6861		.6895		
Δ WT.			0.0215		0.0526		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 74.1 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 10 BLR OUT (~~Inlet, Outlet~~) LOCATION K

Date ________ Box No. ________ Eng. ________

Test Description ________

Dry Gas Meter Vol (ft^3)

Final ________

Initial ________

Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			31	33	19		
DATE WT.			—	—	—		
TARE WT.	1		100.6155	50.3262	.7437		
	2		100.6151	50.3260	.7437		
	3		100.6159	50.3255	.7439		
	4		—	—	—		
AVG.			100.6155	50.3259	.7438		

POST TEST WTS.

	1		~~100.7212~~	50.8416	.8209		
	2		~~100.7196~~	50.8401	.8230		
	3		100.7182	50.8398	.8238		
	4		100.7183	—	—		
AVG.			100.7182	50.8405	.8226		
Δ WT.			0.1027	0.5146	0.0788		

Δ Vlc = ________ ml

Δ DgV = ________ ft^3

Δ Mn 696.1 mgm

LOAD ________ klb/hr

O_2 ________ %

REMARKS: ________

PARTICULATE LAB WORKSHEET

TEST NO. 10 MECH OUT (I~~nlet, Outlet~~) LOCATION K
Date ______ Box No. ______ Eng. ______
Test Description ______

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			30		20		
DATE WT.			—		—		
TARE WT.	1		105.2105		.5753		
	2		105.2103		.5756		
	3		105.2109		.5758		
	4		—		—		
AVG.			105.2106		.5756		

POST TEST WTS.

	1		~~105.2350~~		.6718		
	2		105.2341		.6728		
	3		105.2341		.6745		
	4		105.2333		.6738		
AVG.			105.2338		.6732		
Δ WT.			0.0232		0.0976		

Δ Vlc = ______ ml LOAD ______ klb/hr
Δ DgV = ______ ft^3 O_2 ______ %
Δ Mn 120.8 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 11 BLROUT (~~Inlet, Outlet~~) LOCATION K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			35	33	21		
DATE WT.			—	—	—		
TARE WT.	1		101.4999	50.3262	,7336		
	2		101.5001	50.3260	.7338		
	3		101.5010	50.3255	.7338		
	4		—	—	—		
AVG.			101.5003	50.3259	.7337		
POST TEST WTS.							
	1		~~101.6733~~	~~50.8446~~	.8274		
	2		101.6709	50.8401	.8277		
	3		101.6712	50.8398	.8283		
	4		—	—	—		
AVG.			101.6711	50.8400	.8278		
Δ WT.			0.1708	0.5141	,0941		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 779.0 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 11 MECH OUT (~~Inlet, Outlet~~) LOCATION K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			34		22		
DATE WT.			—		—		
TARE WT.	1		100.1786		.6310		
	2		100.1787		.6307		
	3		100.1790		.6310		
	4		—		—		
AVG.			100.1788		.6309		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		~~100.2138~~		.7600		
	2		100.2118		.7594		
	3		100.2117		.7593		
	4		—		—		
AVG.			100.2117		.7596		
Δ WT.			0.0329		0.1287		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 161.6 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 12 BLR OUT (~~Inlet, Out~~let) LOCATION K

Date ________ Box No. ________ Eng. ________

Test Description ________

Dry Gas Meter Vol (ft^3)

Final ________

Initial ________

Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			42	32	23		
DATE WT.			—	—	—		
TARE WT.	1		103.4598	64.5798	.7888		
	2		103.4597	64.5794	.7888		
	3		103.4583	64.5794	.7889		
	4		—	—	—		
AVG.			103.4593	64.5795	.7888		

POST TEST WTS.

	1		~~103.6688~~	65.2734	~~.8754~~		
	2		103.6642	65.2732	.8712		
	3		103.6625	65.2737	.8718		
	4		—	—	—		
AVG.			103.6625	65.2734	.8715		
Δ WT.			.2032	.6939	.0827		

Δ Vlc = ________ ml LOAD ________ klb/hr

Δ DgV = ________ ft^3 O_2 ________ %

Δ Mn 979.8 mgm REMARKS: ________

PARTICULATE LAB WORKSHEET

TEST NO. 12 MECH OUT (~~Inlet, Outlet~~) LOCATION K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			43		24		
DATE WT.			—		—		
TARE WT.	1		95.9786		.5692		
	2		95.9782		.5691		
	3		95.9770		.5693		
	4		—		—		
AVG.			95.9779		.5692		

POST TEST WTS.

	1		~~96.0269~~		.~~7086~~		
	2		~~96.0244~~		.7039		
	3		96.0230		.7041		
	4		—		—		
AVG.			96.0230		.7040		
Δ WT.			.0451		.1348		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 179.9 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

BLR OUT
TEST NO. 13 (Inlet, Outlet) LOCATION Sik K
Date ______ Box No. ______ Eng. ______
Test Description ______

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			44	37	25		
DATE WT.			—	—	—		
TARE WT.	1		95.0101	50.8314	.7321		
	2		95.0102	50.8307	.7320		
	3		95.0090	50.8315	.7321		
	4		—	—	—		
AVG.			95.0098	50.8312	.7321		

POST TEST WTS.

	1		~~95.~~1967	52.5195	~~.8344~~		
	2		~~95.~~1940	52.5156	.8293		
	3		95.1930	52.5177	.8298		
	4		—	52.5173	—		
AVG.			95.1930	52.5175	.8296		
Δ WT.			.1832	1.6863	.0975		

Δ Vlc = ______ ml LOAD ______ klb/hr
Δ DgV = ______ ft^3 O_2 ______ %
Δ Mn 1967.0 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 13 MECH OUT (~~Inlet, Outlet~~)   LOCATION Site K

Date ______   Box No. ______   Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			45		26		
DATE WT.			—		—		
TARE WT.	1		104.3524		.5951		
	2		104.3527		.5950		
	3		104.3527		.5952		
	4		—		—		
AVG.			104.3526		.5951		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		~~104.4116~~		.7280		
	2		104.4087		.7243		
	3		104.4094		.7248		
	4		—		—		
AVG.			104.4091		.7245		
Δ WT.			.0565		.1294		

Δ Vlc = ______ ml   LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 185.9 mgm   REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 14 (~~Inlet, Outle~~t) BR OUT LOCATION Sik K
Date ____ Box No. ____ Eng. ____
Test Description ____

Dry Gas Meter Vol (ft^3)
Final ____
Initial ____
Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			46	38	27		
DATE WT.			—	—	—		
TARE WT.	1		97.7671	49.6408	.7899		
	2		97.7682	49.6404	.7901		
	3		97.7665	49.6411	.7902		
	4		—	—	—		
AVG.			97.7673	49.6408	.7901		
POST TEST WTS.							
	1		~~97.9202~~	~~51.6304~~	~~.8834~~		
	2		97.9175	51.6269	.8807		
	3		97.9154	51.6288	.8808		
	4		97.9163	51.6279	—		
AVG.			97.9164	51.6278	.8808		
Δ WT.			.1491	1.9870	.0907		

Δ Vlc = ____ ml LOAD ____ klb/hr
Δ DgV = ____ ft^3 O_2 ____ %
Δ Mn 2226.8 mgm REMARKS: ____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 14 MECH OUT (~~Inlet, Outlet~~) LOCATION Site K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			47		28		
DATE WT.			—		—		
TARE WT.	1		102.1442		.6465		
	2		102.1437		.6462		
	3		102.1433		.6463		
	4		—		—		
AVG.			102.1437		.6463		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		~~102.1866~~		~~.7587~~		
	2		~~102.1843~~		.7546		
	3		102.1828		.7546		
	4		—		—		
AVG.			102.1828		.7546		
Δ WT.			.0391		.1083		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 147.4 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. BLR OUT 15 (Inlet, Outlet) LOCATION Site K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			48	39	29		
DATE WT.			—	—	—		
TARE WT.	1		97.0272	50.3266	.7346		
	2		97.0260	50.3262	.7346		
	3		97.0261	50.3266	.7347		
	4		—	—	—		
AVG.			97.0264	50.3265	.7346		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		~~97.9213~~	51.2258	.8224		
	2		97.1775	51.2242	.8222		
	3		97.1765	51.2269	.8224		
	4		—	51.2258	—		
AVG.			97.1770	51.2257	.8223		
Δ WT.			.1506	.8992	.0877		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 1137.5 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 15 MECHOUT (~~Inlet, Outl~~et) LOCATION Side K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			49		30		
DATE WT.			—		—		
TARE WT.	1		100.6160		.6377		
	2		100.6152		.6376		
	3		100.6163		.6376		
	4		—		—		
AVG.			100.6158		.6376		
POST TEST WTS.							
	1		~~100.6515~~		.7346		
	2		100.6456		.7345		
	3		100.6460		.7351		
	4		—		—		
AVG.			100.6458		.7347		
Δ WT.			.0300		.0971		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 127.1 mgm REMARKS: ______

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PARTICULATE LAB WORKSHEET

TEST NO. 16 BLR OUT (~~Inlet, Outlet~~) LOCATION Side K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			50	40	31		
DATE WT.			—	—	—		
TARE WT.	1		99.6640	50.2971	.7896		
	2		99.6643	50.2963	.7897		
	3		99.6639	50.2971	.7899		
	4		—	—	—		
AVG.			99.6641	50.2968	.7897		
POST TEST WTS.							
	1		~~99.8643~~	51.6953	.8999		
	2		99.8583	51.6929	.8996		
	3		99.8589	51.6946	.8997		
	4		—	—	—		
AVG.			99.8586	51.6943	.8997		
Δ WT.			.1945	1.3975	.1100		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 1702.0 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. MECH OUT 16 (~~Inlet, Outle~~t) LOCATION Side K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			51		32		
DATE WT.			—		—		
TARE WT.	1		100.1767		.6277		
	2		100.1770		.6281		
	3		100.1772		.6281		
	4		—		—		
AVG.			100.1770		.6280		
POST TEST WTS.							
	1		100.2106		.7730		
	2		100.2096		.7726		
	3		100.2107		.7738		
	4		—		—		
AVG.			100.2103		.7731		
Δ WT.			.0333		.1451		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 178.4 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 17 BLROUT (~~Inlet, Outlet~~)   LOCATION Sid K

Date ______   Box No. ______   Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			52	41	33		
DATE WT.			—	—	—		
TARE WT.	1		105.2091	64.5810	.7344		
	2		105.2091	64.5810	.7346		
	3		105.2088	64.5800	.7346		
	4		—	—	—		
AVG.			105.2090	64.5807	.7345		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		105.3547	64.8847	.8104		
	2		105.3545	64.8844	.8104		
	3		105.3533	64.8845	.8106		
	4		—	—	—		
AVG.			105.3542	64.8845	.8105		
Δ WT.			.1452	.3038	.0760		

Δ Vlc = ______ ml   LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 525.0 mgm   REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. MECHOUT 17 (Inlet, Outlet) LOCATION Side K

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			53		34		
DATE WT.			—		—		
TARE WT.	1		101.4993		.6301		
	2		101.4998		.6304		
	3		101.4987		.6303		
	4		—		—		
AVG.			101.4993		.6303		

POST TEST WTS.

	1		~~101.5259~~		.7040		
	2		101.5246		.7030		
	3		101.5248		.7041		
	4		—		—		
AVG.			101.5247		.7037		
Δ WT.			.0254		.0734		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 98.3 mgm REMARKS: ______

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SECTION 3.0

GASEOUS DATA

PAGE

3.1 GASEOUS EMISSION SUMMARY 119

3.2 GASEOUS EMISSION DATA SHEET 121

3.3 SOx DATA SHEETS 139

GASEOUS EMISSION SUMMARY

Location: TEST SITE K

Fuel: Alabama Washed Coal

				Boiler Outlet						Dust Collector Outlet						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
01	10-11-79	97	baseline	8.8	9.6	537	240			8.7	10.0	442	235			
02	10-13-79	50		13.6	6.0	539	226	0		13.8	6.0	287	224			
03	10-15-79	74		10.9	8.0	222	290	0		11.0	7.9	249	297			
04	10-16-79	100	hi O_2	8.2	9.7	275	228	2		8.1	9.8	319	209			
05	10-24-79	96	low O_2	7.5	10.0	208	214	0		8.8	9.3	418	209			
06	10-24-79	95	high OFA	8.3	9.6	70	229	0		9.3	9.0	87	257			
07	10-25-79	101	med OFA	7.2	10.6	126	214	0		8.1	9.6	105	196			
08	10-26-79	100	Opt O_2 and OFA	7.3	10.4	105	236	0		7.8	10.0	99	220			
09	10-27-79	41	med OFA	13.0	6.1	187	223	0		13.2	5.9	164	216			
10	10-29-79	74	med OFA	10.1	8.1	380	394	0		10.2	8.0	333	374			
11	10-30-79	102	low O_2 & OFA	6.4	10.9	182	235	0		7.4	10.1	339	234			

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

REV.

GASEOUS EMISSION SUMMARY

Location: TEST SITE K

Fuel: Alabama Washed Coal
Unwashed and Crushed Coal

				Boiler Outlet						Dust Collector Out						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
12	11-6-79	59	baseline Unwashed coal	12.9	6.7	318	302	0		13.6	6.1	544	286			
13	11-7-79	77		11.6	7.0	479	224	0		11.6	7.0	478	250			
14	11-7-79	101	↓ ↓	8.5	9.1	313	261	0		8.7	9.0	327	279			
15	11-8-79	73	baseline Crushed coal	10.0	8.4	237	200	0		10.1	8.3	181	191			
16	11-9-79	101		6.0	11.1	446	200	0		6.4	10.9	259	184			
17	11-10-79	56	↓	10.8	7.7	182	209	0		11.3	7.3	157	199			
18	11-12-79	78	↓ Washed Coal	9.8	8.6	—	209	-		10.3	8.2	—	197	598	1	

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 1
DATE 10-11

FUEL AIA.
LOAD Max
CONDITIONS
DATA TAKEN BY MJ.

RH 41%

Probe Position	PM Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET) NOx		NO		NO_2		HC		REMARKS
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
	1223															
1 2 3	1238	9.1	9.2	343	520	135	204		Hot	Line	Burned		UP			
1 2 3	1246	9.3	9.1	554	855	165	259									58-73
1 2 3	1:00	7.8	10.5	411	561	170	232									41%
9	1:35	9.2	9.6	311	476	155	237									
1	1:44	9.3	9.2	278	460	140	216									
2	2:00	9.6	9.2	340	538	160	253									58-74
3	2 25	8.1	10.2	185	259	200	279									38%
9	2 54	8.4	10.2	242	346	160	229									
1 2 3	310	8.9	9.7	222	331	175	261									58-73
9	330	8.5	10.2	350	505	165	238									41%

AVERAGES

Blrout	X	8.9	9.6	▨	503	▨	243	▨	\	▨	\	▨	\	▨	\	
	X			▨		▨		▨		▨		▨		▨		
Stack	X	8.7	10.0	▨	442	▨	235	▨	\	▨	\	▨	\	▨	\	
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO #2

DATE 10-13-79

FUEL ALA Wash

LOAD Low

CONDITIONS

DATA TAKEN BY mJ

w 54 D 67 RH = 44%

Probe Position	Am Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
	9:59															
123	10:12	13.6	6.1	190		85										
123	10:24	13.75	5.9	152		88.7		96.3		96.3		0				Cal
9	10:37	13.5	6.2	118		85										
1	11:03	14.3	5.8	160		85										
2	11:12	14.0	6.0	156		85.5										
3	11:21	12.5	6.9	100		115										Cal
1·2·3	11:37	13.4	6.2	122		93.8										
123	11 40	13.4	6.1	138		92.5		107.5		107.5		0				
9	11 59	13.8	5.9	123		87.5										
123	12 12	14.0	5.7	135		96.3										
9	12 25	14.0	5.9	102		95.0										

AVERAGES

Stack		13.77	6.0	▨	287	▨	224	▨		▨		▨		▨		
Boiler		13.63	6.0	▨	339	▨	228	▨		▨	0	▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO 3

DATE 10/15/79

FUEL Coal- Alabama Washed

LOAD 3/4 of Full (37.5)

CONDITIONS Baseline

DATA TAKEN BY S. Smith

RH 40%

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
Stack	1200	10.9	7.8	160	286	150	268									
Boiler	1030	10.8	7.8	115	203	140	248									
wet Boiler	12:20	11.3	7.6	155	288			155	288	155	288	0	0			
Boiler	1:07	11.1	8.0	130	237	155	282									
Stack	1:15	11.0	8.0	117	211	180	325									
wet Boiler	1:27	10.9	8.1	110	196	175		178	318	178	318	0	0			
Boiler	2:00	10.4	8.4	108	184	200	340									

AVERAGES

Stack		10.45	7.9	▨	247	▨	297	▨		▨		▨		▨		
Boiler Out		10.9	8.0	▨	222	▨	290	▨		▨		▨	0	▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 4
DATE 10-16-79

FUEL Ala washed
LOAD 50%
CONDITIONS Norm OFA
DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
123	11:00	9.2	8.9	240	367	153	234									
9	11:30	8.8	9.3	229	339	145	215									
123	11:45	7.4	10.2	150	199	155	206									Cal
123	12:02	9.0	9.1	205	308	162	244	175	263	172.5	259.5	2.5	3.8			
9	12:18	7.9	10.0	200	275	158	218									
1	12:37	9.1	8.8	180	273	150	228									
2	12:45	6.5	10.9	120	149	180	224									
3	12:55	6.3	11.1	111	136	215	264									
9	105	8.3	9.7	380	540	160	227									
123	1:15	7.6	10.2	245	330	170	229									Cal
123	1:27	8.5	9.7	179	258	148	214	160.5	231.7	160.5	231.7	0	0			
9	145	7.5	10.1	90	120	130	174									

AVERAGES

Stack		8.1	9.8	▨	319	▨	204	▨		▨		▨		▨		
Boiler Out		8.2	9.7	▨	275	▨	228	▨		▨		▨	2	▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 5
DATE 10-24-79

FUEL Ala wash
LOAD 100%
CONDITIONS Low O_2
DATA TAKEN BY MJ

PBar 30.06

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
	10:15															
1 2 3	10:20	7.9	9.9	205	282	158	218									RH 42%
9	10 40	8.5	9.6	440	635	144	208									Load change
1 2 3	1050	7.7	9.8	150	203	160	216									
1 2 3	11:00	8.0	9.7	170	236	150	208	130	180	130	180	0	0			
1 2 3	11:15	7.5	10.1	115	153	153.7	205									
9	1132	9.1	9.0	132	200	1375	209									
123	[illegible]58	6.7	10.5	109	137	175.	221									RH 90%

AVERAGES

Blr out		7.5	10.0	▨	207.6	▨	213.6	▨		▨		▨		▨		
Stack		8.8	9.3	▨	417.5	▨	208.5	▨	180	▨	180	▨	0	▨		NOx at Blr-out
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 6
DATE 10-24-79

FUEL Ala Wash
LOAD 100%
CONDITIONS Opt O_2 Hi OFA (7.5)
DATA TAKEN BY MJ

PBar 30.025

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1,2,3	1:15	8.0	9.9	42	58	180	249.7									
1-2-3	1:40	8.3	9.5	55	78	175	248	162	230	163	231.5	-1	-1.4			RH = 39%
9	2:00	9.2	9.0	47	72	163	249									
1-2-3	2:15	8.1	9.7	42	59	182	254									Cal Nox
1	230	8.7	9.2	51	75	177	259									
2	241	7.8	10.1	36	49	190	259									
3	250	8.5	9.4	75	108	178	257									
9	315	9.4	9.0	65	101	170	265									
1-2-3	325	8.4	9.5	41	58	190	272									
1-2-3	3:35	8.6	9.4	51	74	180	262	165	240	165	240	0	0			

AVERAGES

Blr Out		8.3	9.6	▨	61.1	▨	229	▨		▨		▨	-.70	▨		
Stack		9.3	9.0	▨	86.5	▨	257	▨	235	▨	235.7	▨		▨		Nox for Blr Out

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO 7

DATE 10-25-79

FUEL ALABAMA WASHED

LOAD 100 %

CONDITIONS opt O_2 Med OFA

DATA TAKEN BY JO

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET) NOx		NO		NO_2		HC		REMARKS
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	1:00	7.5	10.2			158	211									
9	1:18	8.0	9.7	70	97	145	201									
1-2-3	1:40	5.8	11.2	100	118	160	189	158	187	158	187	0	0			
9	2:00	8.1	9.4	80	112	137	191									
1-2-3	2:20	7.5	10.6	106	141	170	227									
1	2:30	8.6	9.7	83	120	150	218									
2	2:45	8.3	10.2	85	120	165	234									
3	3:02	6.8	11.0	90	114	185	235									

AVERAGES

BLR		7.2	10.6	▨	126	▨	214	▨		▨		▨	0	▨		
STACK		8.05	9.55	▨	105	▨	196	▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 8
DATE 10-26-79

FUEL ALABAMA WASHED
LOAD 100%
CONDITIONS opt. OFA
DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	9:28	6.8	11.0	—	—	174										
9	9:41	7.9	9.7	62		158										
1-2-3	9:52	7.2	10.2	85		183										
1-2-3	10:15	7.3	10.2	75		174		150		150			0			
9	10:30	7.4	10.0	78		160										
1-2-3	10:54	7.5	10.4	84		177										CAL
1-2-3	11:18	7.4	10.4	64		185		169		171			-2			RH 44%
9	11:27	8.0	10.0	72		155										
1-2-3	11:40	7.8	10.2	92		185										
9	11:57	7.9	10.2	79		170										

AVERAGES

				▨		▨		▨		▨		▨		▨		
BLR		7.3	10.4	▨	105	▨	236	▨		▨		▨	-1	▨		
STACK		7.8	10.0	▨	99	▨	220	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO 9

DATE 10-27-79

FUEL ALABAMA WASHED

LOAD 50%

CONDITIONS

DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	10:30	12.5	6.8	50		99										
9	10:45	13.2	5.9	78		90										
1-2-3	11:00	13.0	5.9	95		95										
1-2-3	11:25	13.5	5.7	96		100		95		95		0				CAL
9	11:40	13.2	5.9	59		89										
1-2-3	11:53	13.0	6.1	89		99										RH 41%
9	12:03	13.2	5.9	74		100										
9	12:30	13.5	5.8	67		100		95		95		0				CAL

AVERAGES

BLR		13.0	6.1	▨	187	▨	223	▨		▨		▨	0	▨		
STACK		13.2	5.9	▨	164	▨	216	▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 10 (Repeat of test #3)
DATE 10-29-79
FUEL ALABAMA WASHED
LOAD 75%
CONDITIONS
DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	11:41	10.0	8.2	136	223	165	270									
9	11:55	10.1	8.0	177	127	148	245									
1-2-3	12:10	10.1	8.0	153	253	155	256									CAL
1-2-3	12:38	10.5	8.0	168	289	135	232	139	239	139	239	0	0			
9	12:52	10.6	8.0	—	—	122	212									RH 62%
1-2-3	1:09	10.0	8.4	141	231	135	221									
9	1:22	10.1	8.0	164	271	129	214									
1-2-3	1:30	10.0	8.0	152	299	128	210									

AVERAGES

BLR		10.1	8.1	▨	380	▨	394	▨		▨		▨	0	▨		
STACK		10.2	8.0	▨	333	▨	374	▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO 11 (REPEAT of TEST #5)

DATE 10-30-79

FUEL ALABAMA WASHED

LOAD 100 %

CONDITIONS

DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	12:50	6.0	11.2	155		212										
9	12:59	7.2	10.0	256		198										
1-2-3	1:11	5.9	11.2	180		216										CAL
1-2-3	1:35	7.3	10.4	132		170										
1-2-3	1:54	5.9	11.2	147		175		185		185		0				
9	2:11	7.6	10.2	—	—	155										RH 63%
1-2-3	2:22	7.0	10.4	122		180										

AVERAGES

				▨		▨		▨		▨		▨		▨		
BLR		6.4	10.9	▨	182	▨	235	▨		▨		▨	0	▨		
STACK		7.4	10.1	▨	339	▨	234	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 12
DATE 11-6-79
FUEL ALABAMA UNWASHED
LOAD 50 %
CONDITIONS BASELINE
DATA TAKEN BY JD

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET) NOx		NO		NO2		HC		REMARKS
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	3:53	13.5	6.2	—	—	115	[illegible]									
9	4:10	14.2	5.7	226	[illegible]	110	247									
1-2-3	4:20	13.2	6.6	102	237	145	[illegible]									
1-2-3	4:40	11.5	7.6	69	[illegible]	140	[illegible]	135		135			0			
9	4:50	13.7	6.2	267	[illegible]	120	[illegible]									44 % RH
1-2-3	5:03	13.2	6.2	256	[illegible]	140	325									CAL.
9	5:20	13.0	6.4	172	[illegible]	120	[illegible]									

AVERAGES

				▨		▨		▨		▨		▨		▨		
BLR		12.9	6.7	▨	318	▨	302	▨		▨		▨	0	▨		
STACK		13.6	6.1	▨	544	▨	286	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO 13

DATE 11-7-79

FUEL ALABAMA WASHED

LOAD 75%

CONDITIONS

DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	9:36	12.5	6.4	262	558	105	224									
9	9:50	12.0	6.8	213	428	123	247									
1-2-3	10:09	10.7	7.6	156	274	128	225									
1-2-3	10:31	10.7	7.8	208	365	120	211	132	232	138	242		-10			
9	11:02	10.7	7.8	309	542	160	281									
1-2-3	11:18	12.5	6.2	337	718	110	234									
9	11:32	12.0	6.4	230	463	110	221									

AVERAGES

				▨		▨		▨		▨		▨	-10	▨		
BLR		11.6	7.0	▨	479	▨	224	▨		▨		▨		▨		
STACK		11.6	7.0	▨	470	▨	250	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 14
DATE 11-7-79
FUEL ALABAMA UNWASHED
LOAD 100 %
CONDITIONS
DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	2:08	8.5	9.4	182	263	185	267									
9	2:30	8.7	9.0	223	327	190	279									
1-2-3	2:50	8.0	9.2	283	393	183	254									
1-2-3	3:01	9.0	8.6	188	283			180	271	177	266		+5			

AVERAGES

				▨		▨		▨		▨		▨		▨		
BLR		8.5	9.1	▨	313	▨	261	▨		▨		▨	-5	▨		
STACK		8.7	9.0	▨	327	▨	279	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are.corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO 15

DATE 11-8-79

FUEL CRUSHED ALABAMA

LOAD 75%

CONDITIONS

DATA TAKEN BY JD

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO · ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET) NOx		NO		NO2		HC		REMARKS
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	11:50	10.2	8.4	150	251	114	191									
9	12:04	10.5	8.2	105	181	110	189									
1-2-3	12:28	10.0	8.4	129	212	132	217									
1-2-3	12:42	9.7	8.5	185	296	131	209	129	206	133	213		-7			
9	1:16	9.7	8.4	113	181	120	192									
1-2-3	1:30	10.2	8.4	113	189	110	184									
																Tdry - 69
																Twet - 55
																%RH - 44

AVERAGES

BLR		10.0	8.4	▨	237	▨	260	▨		▨		▨	-7	▨		
STACK		10.1	8.3	▨	181	▨	191	▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 16
DATE 11-9-79

FUEL CRUSHED
LOAD 100%
CONDITIONS
DATA TAKEN BY JOB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NO_x		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	12:10	6.3	10.6	540	662	135	165									CO very high
1-2-3	1230	6.6	10.6	560	701	150	188									
1-2-3	1250	6.1	11.0	170	206	190	230									
9	1310	5.7	11.4	200	236	160	188									
9	1320	6.6	10.9	220	275	170	213									
1-2-3	1340	4.9	12.0	190	213	195	218	192	215	195	218		-3			
9	1400	6.8	10.4	210	266	120	152									

AVERAGES

BLR		6.0	11.1		446		200						-3			
STACK		6.4	10.9		259		184									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K

TEST NO 17

DATE 11-10-79

FUEL CRUSHED-ALABAMA

LOAD 50%

CONDITIONS

DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NO_x		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-2-3	9:27	11.0	7.4	115	208	112	203									
9	9:44	11.1	7.4	86	157	110	201									
1-2-3	10:04	10.7	7.6	94	164	125	219									
1-2-3	10:15	10.3	7.8	103	174	122	206	128	216	128	216		0			% RH 65
9	10:43	11.5	7.2	82	156	103	196									
1-2-3	—	11.0	7.8	101	183	115	208									

AVERAGES

BLR OUT		10.8	7.7	▨	182	▨	209	▨		▨		▨		▨		
STACK		11.3	7.3	▨	157	▨	199	▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE K
TEST NO 18
DATE 11-12-79

FUEL WASHED ALABAMA
LOAD 75-80%
CONDITIONS SASS
DATA TAKEN BY JOB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-2-3	12:30	9.5	9.0	005	—	135	212									Tdry - 69
																Twet - 54
9	12:50	10.1	8.6	—	—	108	179									RH - 40%
1-2-3	13:20	9.8	8.7	—	—	134	216									
9	13:50	10.3	8.2	—	—	120	203									
1-2-3	14:25	9.8	8.6	—	—	125	202									
9	14:50	10.3	8.2	—	—	115	194									
2-3-4	15:20	9.8	8.5	—	—	132	213									
9	15:50	10.4	8.0	—	—	117	199									
2-3-4	16:25	10.3	8.1	—	—	120	203									
9	17:00	10.3	8.2	—	—	125	211									

AVERAGES

BR'MT		9.8	8.6	▨	—	▨	209	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
STACK		10.3	8.2	▨	—	▨	197	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

Local *Site K*

SOx DATA SHEET

Date *11-12-79* Probe Location & Probe Length *4' –*

Unit # ______ Fuel *ALABAMA WASHED* Load ______

Test Description: ______

Test No.	Box No.	Sample Time	Meter Temp.(T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
18 A	SHELL	13:50	91	-0-	0.000	30.15	IN	14:12	9.87
		14:11	91	-0-	1.400			14:42	
18 B		14:54	92	-0-	0.000			15:16	10.0
		15:14	93	-0-	1.500			15:46	
18 C	METHOD #6	16:00	93	-0-	0.000			16:15	10.0
		16:13	93	-0-	1.500			16:35	

method #6 – AP .12 – .12 CFM

SAMPLED BY PAP

	Test # 18A SO2	Test # 18A SO3	Test # 18A SOx	Test # 18B SO2	Test # 18B SO3	Test # 18B SOx	Test # 18C SO2	Test # 18C SO3	Test # 18C SOx
Normality N	PD Titrant .0105	→				→	.00989		
Dilution Factor F	20	1		20	1		5	1	
Blank B	— — —	— — —	— — —	— — —	— — —	— — —			
Averages	—	—	—	—	—	—			
Ml. of Titrant A	6.4 6.3 6.4	-0-		6.3 6.3 6.3	.5		20.0 19.9 19.9	.2	
Averages	6.4			6.3			19.9		
460 + T	551			552.5			553		
Sample Vol. V	1.400			1.500			1.500		
P + p	30.15	→		30.15	→		30.15		
A - B	6.4	0		6.3	.5		19.9		

TITRATED BY PAP

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(6.4)(.0105)(20)(551)24}{(1.4)(30.15)}$$

SO2 = 421 SO3 = 0

$$SO3 = \frac{(0)(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 @ 3% O2 = 683

SO3 @ 3% O2 = 0

SOx @ 3% O2 = 683

$$SO2 = \frac{(6.3)(.0105)(20)(552.5)24}{(1.5)(30.15)}$$

SO2 = 388

$$SO3 = \frac{(.5)(.0105)(1)(552.5)24}{(1.5)(30.15)}$$

SO3 = 1.5

SO2 @ 3% O2 = 637

SO3 @ 3% O2 = 2.4

SOx @ 3% O2 = 640

$$SO2 = \frac{(19.9)(.00989)(5)(553)24}{(1.5)(30.15)}$$

SO2 = 288.7

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = .58

SO2 @ 3% O2 = 474

SO3 @ 3% O2 = 1

SOx @ 3% O2 = 475

RR30-4, Rev

SECTION 4.0

PARTICLE SIZE DISTRIBUTION

PAGE

4.1 BRINK 141

4.2 SASS 150

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 3

LOAD 75%

TEST SITE K

% O_2 10.9

TEST DATE 10-15-79

FUEL Alabama Washed

SAMPLE LOCATION BLR OUT PORT #2

SPECIAL CONDITIONS as found

GAS VELOCITY DETERMINATION

.073

PITOT TUBE ΔP .07, .07, .08

GAS TEMP. °R, Ts 990

PITOT CORRECTION FACTOR, Cp .837

BAROMETRIC PRESS in. Hg, P_{bar} 30.32

GAS STATIC PRESS in. H_2O -.90, -.79

GAS STATIC PRESS in. Hg abs, Ps 30.26

MOLECULAR WT. FLUE GAS, MW_s 29.4

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MWs}\right)^{1/2} = \underline{20.395}\ \text{ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn .116

NOZZLE AREA ft^2, An 7.339×10^{-5} $An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60 = \underline{.0898}$ ft^3/min at nozzle

$Qc = Qs\ \left(\frac{PsMWs}{1.3Ts}\right)^{1/2} = \underline{.0746}$ ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 32 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 28.25 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	0.000	0.000	98
FINAL	33.4	1.500	98
Δ			

$\%H_2O$ = ______ %

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An(1-\frac{\%H_2O}{100})} = \underline{94.6}\ \%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

BRINK #1

TEST No. 3

LOCATION Site K

TEST DATE 10-15-79

ENGINEER

TEST DESCRIPTION

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		4						
TARE WT.	1	50.3266	3.5101	3.0928	3.9809	3.4634	3.9009	.0381
	2	50.3264	3.5101	3.0928	3.9808	3.4638	3.9012	.0385
	3	50.3264	3.5101	3.0928	3.9808	3.4636	3.9010	.0382
	4	—	—	—	—	—	—	—
AVERAGE		50.3265	3.5101	3.0928	3.9808	3.4636	3.9010	0.0383

POST TEST WEIGHTS (GRAMS)

DATE WT.								
GROSS WT.	1	50.3396	3.5109	3.0949	3.9817	3.4641	3.9013	.0389
	2	50.3396	3.5110	3.0948	3.9818	3.4638	3.9010	.0391
	3	50.3392	3.5110	3.0949	3.9819	3.4640	3.9011	.0392
	4	—	—	—	—	—	—	—
AVERAGE		50.3395	3.5110	3.0949	3.9818	3.4640	3.9011	0.0391

NET TEST RESULTS

NET WT.	0.0130	0.0009	0.0021	0.0010	0.0004	0.0001	0.0008
PERCENT	71.038	4.918	11.475	5.464	2.186	0.546	4.372

TOTAL NET WEIGHT 18.3 mgm

#15900

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 3
TEST SITE K
TEST DATE 10-15-79
SAMPLE LOCATION BLR OUT PORT #2
LOAD 75%
% O_2 10.9
FUEL Alabama washed coal
SPECIAL CONDITIONS

ρp - Density of particles 2.5 g/cm³
μ - Viscosity of flue gas 268×10^{-4} poise
MWs - Molecular wt. flue gas 29.13 g/g mole
ΔP_I - Pressure drop across impactor 32.0 in H_2O
Ps - Absolute stack pressure 30.26 in. Hg
Ts - Absolute stack temperature 990 °R
Qs - Actual flow rate at stack conditions 0.0898 ft³/min
Vm - Dry gas volume ______ SCF
Mn - Total particulate mass 18.3 mgm
Cn - Total concentration ______ grains/SCF
I - Percent isokinetics 94.6 %
Vs - Gas velocity 20.395 ft/sec.
Dn - Nozzle diameter 0.116 in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		0.2490	0.1775	0.1346	0.0946	0.0731	
Fj - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3277	
$D_{S,50}$ Stokes diameter, μm		2.62	1.50	0.98	0.46	0.25	
$D_{A,50}$ Aerodynamic diameter, μm		4.26	2.48	1.67	0.84	0.50	
$D_{AI,50}$ Aerodynamic impaction diameter, μm		4.47	2.69	1.88	1.04	0.702	
Mn - Particulate mass, mgm	13.0	0.9	2.1	1.0	0.4	0.1	0.8
% - Percent of Total	71.04	4.92	11.48	5.46	2.19	0.55	4.37
Cumulative percent	28.96	24.04	12.56	7.10	4.91	4.36	0
Cn - Concentration, grains/SCF							
Cumulative concentration, grains/SCF							

FIGURE 6.

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 8

LOAD 100 %

TEST SITE K

% O_2 7.3

TEST DATE 10-26-79

FUEL ALABAMA WASHED

SAMPLE LOCATION BLR OUT PORT #2

SPECIAL CONDITIONS opt O_2 + OFA

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP .105, .09, .07 $\boxed{.088}$

BAROMETRIC PRESS in. Hg, P_{bar} 30.26

GAS TEMP. °R, Ts 1035

GAS STATIC PRESS in. H_2O -1.2

PITOT CORRECTION FACTOR, Cp .837

GAS STATIC PRESS in. Hg abs, Ps 30.17

MOLECULAR WT. FLUE GAS, MW_s 29.4

$$Vs = 85.48\ Cp \left(\frac{Ts\ \Delta P}{Ps\ MWs}\right)^{1/2} = 22.98 \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn .112

NOZZLE AREA ft^2, An 6.842×10^{-5}

$$An = \pi(Dn/24)^2$$

$$Qn = Vs\ An\ 60 = .0943 \text{ ft}^3\text{/min at nozzle}$$

$$Qc = Qs \left(\frac{PsMWs}{1.3Ts}\right)^{1/2} = .0766 \text{ ft}^3\text{/min corrected to calibration conditions}$$

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 27.8 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 29.0 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	0.00	0.000	92
FINAL	42.49	2.000	93
Δ	42.82		

$\%H_2O$ = 6 %

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An(1-\frac{\%H_2O}{100})} = 98.8\ \%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. BRINK#2 8

LOCATION Site K

TEST DATE 10-26-79

ENGINEER M.J.

TEST DESCRIPTION

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		23						
TARE WT.	1	49.6401	3.4125	3.2711	3.4974	3.7803	3.3014	.0368
	2	49.6407	3.4124	3.2712	3.4971	3.7805	3.3013	.0367
	3	49.6400	3.4122	3.2710	3.4969	3.7804	3.3013	.0368
	4	—	—	—	—	—	—	—
AVERAGE		49.6403	3.4124	3.2711	3.4971	3.7804	3.3013	0.0368

POST TEST WEIGHTS (GRAMS)

DATE WT.								
GROSS WT.	1	49.6810	3.4131	3.2734	3.4976	3.7808	3.3016	.0368
	2	49.6812	3.4132	3.2735	3.4976	3.7806	3.3014	.0367
	3	49.6798	3.4135	3.2737	3.4977	3.7806	3.3017	.0368
	4	—	—	—	—	—	—	—
AVERAGE		49.6807	3.4133	3.2735	3.4976	3.7807	3.3016	0.0365

NET TEST RESULTS

NET WT.	0.0404	0.0009	0.0024	0.0005	0.0003	0.0003	0.0000
PERCENT	90.18	2.01	5.36	1.12	0.67	0.67	0.00

TOTAL NET WEIGHT 44.8 mgm

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 8
TEST SITE K
TEST DATE 10-25-79
SAMPLE LOCATION BLR OUT

LOAD 100%
% O_2 7.3
FUEL Alabama washed coal
SPECIAL CONDITIONS opt O_2 + OFA

ρp - Density of particles 2.5 g/cm^3
μ - Viscosity of flue gas 2.75×10^{-4} poise
MWs - Molecular wt. flue gas 29.19 g/g mole
ΔP_I - Pressure drop across impactor 27.8 in H_2O
Ps - Absolute stack pressure 30.17 in. Hg
Ts - Absolute stack temperature 1035 °R
Qs - Actual flow rate at stack conditions .0943 ft^3/min

Vm - Dry gas volume ________ SCF
Mn - Total particulate mass ________ mgm
Cn - Total concentration ________ grains/SCF
I - Percent isokinetics ________ %
Vs - Gas velocity ________ ft/sec.
Dn - Nozzle diameter ________ in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		0.2490	0.1775	0.1396	0.0946	0.0731	
Fj - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0403	0.3277	
$D_{S,50}$ Stokes diameter, μm		257	1.46	0.96	0.44	0.24	
$D_{A,50}$ Aerodynamic diameter, μm		4.19	2 44	1.63	0.81	0 48	
$D_{AI,50}$ Aerodynamic impaction diameter, μm		442	2 66	1.85	1.03	0.696	
Mn - Particulate mass, mgm	40.4	09	2 4	0 5	0 3	0.3	0.0
% - Percent of Total	90.8	201	5.36	1.12	0 67	0.67	0
Cumulative percent	9.82	781	245	1.33	0 66	0	0
Cn - Concentration, grains/SCF							
Cumulative concentration, grains/SCF							

FIGURE 6.

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 16

LOAD 75%

TEST SITE K

% O_2 6.0

TEST DATE 11-9-79

FUEL ALABAMA CRUSHED

SAMPLE LOCATION BLROUT PORT#2

SPECIAL CONDITIONS as found

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP .11 .10 .07 $\boxed{.09}$

GAS TEMP. °R, Ts 1035

PITOT CORRECTION FACTOR, Cp .837

BAROMETRIC PRESS in. Hg, P_{bar} 29.65

GAS STATIC PRESS in. H_2O −1.0" H_2O

GAS STATIC PRESS in. Hg abs, Ps 29.58

MOLECULAR WT. FLUE GAS, MW_s 29.4

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MWs}\right)^{1/2} = 23.42 \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn .077

NOZZLE AREA ft^2, An 3.233×10^{-6}

$An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60 = .045$ ft^3/min at nozzle

$Qc = Qs\ \left(\frac{PsMWs}{1.3Ts}\right)^{1/2} = .036$ ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 6.5 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 7.5 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	0.00	0.000	96
FINAL	61.00	1.200	96
Δ			

%H_2O = 6 %

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An(1-\frac{\%H_2O}{100})} = 86\ \%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. BRINK #3 16

LOCATION Site K

TEST DATE 11-9-79

ENGINEER J.D.

TEST DESCRIPTION

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.								
TARE WT.	1	4.8704	3.5104	3.0927	3.9808	3.4633	3.9013	.0399
	2	}	3.5103	3.0926	3.9808	3.4632	3.9013	.0395
	3	}	3.5104	3.0927	3.9809	3.4633	3.9014	.0397
	4	}	—	—	—	—	—	—
AVERAGE		4.8704	35104	3.0927	3.9808	3.4633	3.9013	0.0397

POST TEST WEIGHTS (GRAMS)

DATE WT.			~~3~~ —					
GROSS WT.	1	4.8834	3.5113	3.0933	3.9815	3.4634	3.9016	.0401
	2	}	3.5112	3.0932	3.9813	3.4634	3.9015	.0401
	3	}	3.5110	3.0933	3.9815	3.4636	3.9016	.0404
	4	}	—	—	—	—	—	—
AVERAGE		4.8834	35112	3.0933	3.9814	3.4635	39016	0.0402

NET TEST RESULTS

NET WT.	0.0130	0.0008	0.0006	0.0006	0.0002	0.0003	0.0005
PERCENT	81.25	5.00	3.75	3.75	1.25	1.88	3.13

TOTAL NET WEIGHT 16.0 mgm

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 16
TEST SITE K
TEST DATE 11-9-79
SAMPLE LOCATION BLR OUT PORT #2
LOAD 100%
% O_2 6.0
FUEL Alabama crushed coal
SPECIAL CONDITIONS as found

ρp - Density of particles 2.5 g/cm^3
μ - Viscosity of flue gas 2.75×10^{-4} poise
MWs - Molecular wt. flue gas 29.09 g/g mole
ΔP_I - Pressure drop across impactor 6.5 in H_2O
Ps - Absolute stack pressure 29.58 in. Hg
Ts - Absolute stack temperature 1035 °R
Qs - Actual flow rate at stack conditions 0.045 ft^3/min
Vm - Dry gas volume ________ SCF
Mn - Total particulate mass ________ mgm
Cn - Total concentration ________ grains/SCF
I - Percent isokinetics ________ %
Vs - Gas velocity ________ ft/sec.
Dn - Nozzle diameter ________ in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		0.2490	0.1715	0.1396	0.0946	0.0731	
Fj - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3277	
Ds_{50} Stokes diameter, μm		3.82	2.21	1.48	0.73	0.43	
$D_{A,50}$ Aerodynamic diameter, μm		6.17	3.62	2.46	1.27	0.79	
$D_{AI,50}$ Aerodynamic impaction diameter, μm		6.40	3.85	2.69	1.50	1.02	
Mn - Particulate mass, mgm	13.0	0.8	0.6	0.6	0.2	0.3	0.5
% - Percent of Total	81.25	5.00	3.75	3.75	1.25	1.88	3.13
Cumulative percent	18.75	13.75	10.00	6.25	5.00	3.12	0
Cn - Concentration, grains/SCF							
Cumulative concentration, grains/SCF							

FIGURE 6.

TM#15900-511

SITE K

SASS GRAVIMETRICS

			%	% Passing
Test #18	10μ	10.0430 gm	86.80	13.20
	3μ	0.8322 gm	7.19	6.01
	1μ	0.1052 gm	0.91	5.10
	Filter	0.5900 gm	5.10	0
	Total	11.5704 gm		

SECTION 5.0

FUEL AND ASH ANALYSIS

		PAGE
5.1	COMMERCIAL TESTING ANALYSIS	152
5.2	COMBUSTIBLES ANALYSIS	207
5.3	COAL SIEVE ANALYSIS	209

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., P.O. BOX 127
SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Washed Alabama Coal	Test #1
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-11-79	
Date received	11-29-79	

Analysis report no. 71-43297

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.34	xxxxx
% Ash	5.55	5.86
% Volatile	37.85	39.98
% Fixed Carbon	51.26	54.16
	100.00	100.00
Btu/lb.	13188	13932
% Sulfur	1.14	1.20

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx F	xxxx F
Softening (H=W)	xxxx F	xxxx F
Softening (H=½W)	xxxx F	xxxx F
Fluid	xxxx F	xxxx F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Coal	Sample, Test 2
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-13-79	
Date received	11-29-79	

Analysis report no. 71-43300

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.25	xxxxx
% Ash	5.17	5.57
% Volatile	39.31	42.38
% Fixed Carbon	48.27	52.05
	100.00	100.00
Btu/lb.	12942	13954
% Sulfur	0.29	1.30

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H=W)	xxxx°F	xxxx°F
Softening (H=½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification
by KVB, Inc.

Test #3

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	----
Date received	11-29-79

Analysis report no. 71-43303

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	6.45	xxxxx
% Ash	4.03	4.31
% Volatile	37.58	40.17
% Fixed Carbon	51.94	55.52
	100.00	100.00
Btu/lb.	13261	14175
% Sulfur	1.44	1.54

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H = W)	xxxx°F	xxxx°F
Softening (H = ½ W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification
by KVB, Inc.

Test #4

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	----
Date received	11-29-79

Analysis report no. 71-43306

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.40	xxxxx
% Ash	3.32	3.59
% Volatile	38.10	41.15
% Fixed Carbon	51.18	55.26
	100.00	100.00
Btu/lb.	13209	14265
% Sulfur	1.03	1.11

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H = W)	xxxx°F	xxxx°F
Softening (H = ½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

Charter Member

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test #5

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-24-79
Date received	11-29-79

Analysis report no. 71-43309

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	6.00	xxxxx
% Ash	3.44	3.66
% Volatile	38.15	40.59
% Fixed Carbon	52.41	55.75
	100.00	100.00
Btu/lb.	13438	14296
% Sulfur	1.03	1.10

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX°F	XXXX°F
Softening (H=W)	XXXX°F	XXXX°F
Softening (H=½W)	XXXX°F	XXXX°F
Fluid	XXXX°F	XXXX°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal	Test #6
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-24-79	
Date received	11-29-79	

Analysis report no. 71-43312

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.13	xxxxx
% Ash	5.30	5.71
% Volatile	36.20	38.98
% Fixed Carbon	51.37	55.31
	100.00	100.00
Btu/lb.	12868	13856
% Sulfur	2.67	2.88

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H = W)	xxxx°F	xxxx°F
Softening (H = ½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test #7

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-25-79
Date received	11-29-79

Analysis report no. 71-43315

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.63	xxxxx
% Ash	4.55	4.93
% Volatile	36.86	39.91
% Fixed Carbon	50.96	55.16
	100.00	100.00
Btu/lb.	13023	14099
% Sulfur	0.91	0.99

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H=W)	xxxx°F	xxxx°F
Softening (H=½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification
by KVB, Inc.

Test #8

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-26-79
Date received	11-29-79

Analysis report no. 71-43318

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.44	xxxxx
% Ash	3.45	3.73
% Volatile	36.53	39.47
% Fixed Carbon	52.58	56.80
	100.00	100.00
Btu/lb.	13170	14229
% Sulfur	0.86	0.93

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H = W)	xxxx°F	xxxx°F
Softening (H = ½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification
by KVB, Inc.

Test #9

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-27-79
Date received	11-29-79

Analysis report no. 71-43321

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.99	xxxxx
% Ash	5.19	5.52
% Volatile	37.04	39.40
% Fixed Carbon	51.78	55.08
	100.00	100.00
Btu/lb.	13171	14010
% Sulfur	0.95	1.01

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H = W)	xxxx°F	xxxx°F
Softening (H = ½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test #10

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-29-79
Date received	11-29-79

Analysis report no. 71-43324

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.41	xxxxx
% Ash	4.44	4.69
% Volatile	37.71	39.87
% Fixed Carbon	52.44	55.44
	100.00	100.00
Btu/lb.	13397	14163
% Sulfur	1.13	1.19

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX °F	XXXX °F
Softening (H=W)	XXXX °F	XXXX °F
Softening (H=½W)	XXXX °F	XXXX °F
Fluid	XXXX °F	XXXX °F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification
by KVB, Inc.

Test 11

Kind of sample reported to us	Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-30-79
Date received	11-29-79

Analysis report no. 71-43327

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	6.44	xxxxx
% Ash	3.51	3.75
% Volatile	37.37	39.94
% Fixed Carbon	52.68	56.31
	100.00	100.00
Btu/lb.	13348	14267
% Sulfur	1.21	1.29

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H = W)	xxxx°F	xxxx°F
Softening (H = ½ W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Unwashed Alabama Coal	Test 12
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-6-79	
Date received	11-29-79	

Analysis report no. 71-43330

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.99	xxxxx
% Ash	8.40	8.94
% Volatile	34.48	36.68
% Fixed Carbon	51.13	54.38
	100.00	100.00
Btu/lb.	12601	13404
% Sulfur	1.19	1.27

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX°F	XXXX°F
Softening (H = W)	XXXX°F	XXXX°F
Softening (H = ½W)	XXXX°F	XXXX°F
Fluid	XXXX°F	XXXX°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test 13

Kind of sample reported to us	Unwashed Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	11-7-79
Date received	11-29-79

Analysis report no. 71-43333

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	6.59	xxxxx
% Ash	8.35	8.94
% Volatile	33.70	36.08
% Fixed Carbon	51.36	54.98
	100.00	100.00
Btu/lb.	12468	13348
% Sulfur	0.96	1.03

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H=W)	xxxx°F	xxxx°F
Softening (H=½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

Charter Member

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test #14

Kind of sample reported to us	Unwashed Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	11-7-79
Date received	11-29-79

Analysis report no. 71-43334

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	6.00	xxxxx
% Ash	13.96	14.85
% Volatile	32.88	34.98
% Fixed Carbon	47.16	50.17
	100.00	100.00
Btu/lb.	11770	12521
% Sulfur	0.88	0.94

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H = W)	xxxx°F	xxxx°F
Softening (H = ½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H — Cone Height
W — Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test 15

Kind of sample reported to us	Crushed Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	11-8-79
Date received	11-29-79

Analysis report no. 71-43338

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.97	xxxxx
% Ash	4.57	4.97
% Volatile	36.85	40.04
% Fixed Carbon	50.61	54.99
	100.00	100.00
Btu/lb.	12936	14056
% Sulfur	1.13	1.23

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX°F	XXXX°F
Softening (H = W)	XXXX°F	XXXX°F
Softening (H = ½W)	XXXX°F	XXXX°F
Fluid	XXXX°F	XXXX°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

TEST #16

Kind of sample reported to us	Crushed Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	11-9-79
Date received	11-29-79

Analysis report no. 71-43346

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	6.82	xxxxx
% Ash	4.19	4.50
% Volatile	37.23	39.95
% Fixed Carbon	51.76	55.55
	100.00	100.00
Btu/lb.	13148	14110
% Sulfur	1.35	1.45

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx°F	xxxx°F
Softening (H=W)	xxxx°F	xxxx°F
Softening (H=½W)	xxxx°F	xxxx°F
Fluid	xxxx°F	xxxx°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test 17

Kind of sample reported to us	Crushed Coal
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	11-10-79
Date received	11-29-79

Analysis report no. 71-43342

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.27	xxxxx
% Ash	5.28	5.69
% Volatile	36.07	38.90
% Fixed Carbon	51.38	55.41
	100.00	100.00
Btu/lb.	12897	13908
% Sulfur	1.44	1.55

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX°F	XXXX°F
Softening (H=W)	XXXX°F	XXXX°F
Softening (H=½W)	XXXX°F	XXXX°F
Fluid	XXXX°F	XXXX°F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Washed Alabama Coal	Test 18
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-13-79	
Date received	11-29-79	

Analysis report no. 71-43345

PROXIMATE ANALYSIS

	As Rec'd.	Dry Basis
%Moisture	6.80	xxxxx
%Ash	3.91	4.20
% Volatile	37.42	40.15
% Fixed Carbon	51.87	55.65
	100.00	100.00
Btu/lb.	13168	14129
% Sulfur	1.39	1.49

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	6.80	xxxxx
% Carbon	73.85	79.24
% Hydrogen	5.00	5.36
% Nitrogen	1.55	1.66
% Chlorine	0.07	0.07
% Sulfur	1.39	1.49
% Ash	3.91	4.20
% Oxygen (diff)	7.43	7.98
	100.00	100.00

Fusions, FSI, Grindability & Ash Analyses To Follow.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, Inc.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 21, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Washed Alabama Coal	Test 18
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-13-79	
Date received	11-29-79	

Analysis report no. 71-43345 (COMPLETED REPORT)

MINERAL ANALYSIS	% Weight Ignited Basis
Silica, SiO_2	38.35
Alumina, Al_2O_3	26.25
Titania, TiO_2	1.14
Ferric oxide, Fe_2O_3	21.19
Lime, CaO	5.59
Magnesia, MgO	1.57
Potassium oxide, K_2O	1.75
Sodium oxide, Na_2O	0.25
Sulfur trioxide, SO_3	1.99
Phos. pentoxide, P_2O_5	0.10
Undetermined	1.82
	100.00
Alkalies as Na_2O Dry Coal Basis =	0.06
Silica Value =	57.50
Base:Acid Ratio =	0.46
T_{250} Temperature =	2345°F

FUSION TEMPERATURE OF ASH	Reducing
Initial Def., IT	2100°F
Softening, ST	2280°F
Softening, HT	2310°F
Fluid, FT	2600°F

Free Swelling Index: 1-1/2

Hardgrove Grindability Index: 40

Fouling Index: 0.12
Slagging Index: 0.69

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

January 4, 1980

KVB, INC.
A Research Cottrell Co.
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

Kind of sample reported to us	Coal
Sample taken at	Site K
Sample taken by	KVB, Inc.
Date sampled	——
Date received	11/29/79

Sample identification by KVB, Inc.

Composite unwashed coal
Site K

Analysis report no. 71-43347 COMPLETED REPORT . 'eight

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	4.76	xxxxx
% Ash	7.98	8.38
% Volatile	34.87	36.61
% Fixed Carbon	52.39	55.01
	100.00	100.00
Btu/lb.	12768	13406
% Sulfur	1.10	1.16
% Alk. as Na_2O	xxxxx	0.17
SULFUR FORMS		
% Pyritic Sulfur	0.52	0.55
% Sulfate Sulfur	0.03	0.03
% Organic Sulfur	0.55	0.58
WATER SOLUBLE ALKALIES		
% Na_2O =	xxxx	xxxx
% K_2O =	xxxx	xxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2110 °F	xxxx °F
Softening (H=W)	2470 °F	xxxx °F
Softening (H=½W)	2510 °F	xxxx °F
Fluid	2700 °F	xxxx °F
% EQUILIBRIUM MOISTURE =	——	
HARDGROVE GRINDABILITY INDEX =	42	
FREE SWELLING INDEX =	——	

ULTIMATE ANALYSIS	As received	Dry basis
Moisture	4.76	xxxxx
Carbon	72.21	75.82
Hydrogen	4.68	4.91
Nitrogen	1.44	1.51
Chlorine	0.05	0.05
Sulfur	1.10	1.16
Ash	7.98	8.38
Oxygen (diff)	7.78	8.17
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	52.64
Alumina, Al_2O_3	24.64
Titania, TiO_2	0.88
Ferric oxide, Fe_2O_3	12.41
Lime, CaO	2.62
Magnesia, MgO	1.32
Potassium oxide, K_2O	2.75
Sodium oxide, Na_2O	0.27
Sulfur trioxide, SO_3	1.63
Phos. pentoxide, P_2O_5	0.05
Undetermined	0.79
	100.00
SILICA VALUE =	76.30
BASE: ACID RATIO	0.25
T_{250} Temperature =	2625°F

Fouling index.......... 0.07
Slagging index......... 0.29

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research Cottrell Co.
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

January 4, 1980

Kind of sample reported to us: Coal

Sample identification by: KVB, Inc.

Sample taken at: Site K

Crushed Coal Composite
Site K

Sample taken by: KVB, Inc.

Date sampled: ——

Date received: 11/29/79

Analysis report no. 71-43348 COMPLETED REPORT .'eight

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	5.84	xxxxx
% Ash	4.15	4.41
% Volatile	37.53	39.86
% Fixed Carbon	52.48	55.73
	100.00	100.00
Btu/lb.	13284	14108
% Sulfur	0.94	1.00
% Alk. as Na_2O	xxxxx	0.07
SULFUR FORMS		
% Pyritic Sulfur	0.34	0.36
% Sulfate Sulfur	0.05	0.05
% Organic Sulfur	0.55	0.59
WATER SOLUBLE ALKALIES		
% Na_2O =	xxxx	xxxx
% K_2O =	xxxx	xxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2190 °F	xxxx °F
H is Cone Height — Softening (H = W)	2330 °F	xxxx °F
W is Cone Width — Softening (H = ½W)	2360 °F	xxxx °F
Fluid	2610 °F	xxxx °F

% EQUILIBRIUM MOISTURE = ——
HARDGROVE GRINDABILITY INDEX = 40
FREE SWELLING INDEX = 2

ULTIMATE ANALYSIS	As received	Dry basis
Moisture	5.84	xxxxx
Carbon	74.25	78.85
Hydrogen	4.97	5.28
Nitrogen	1.42	1.51
Chlorine	0.06	0.06
Sulfur	0.94	1.00
Ash	4.15	4.41
Oxygen (diff)	8.37	8.89
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	43.86
Alumina, Al_2O_3	26.25
Titania, TiO_2	1.10
Ferric oxide, Fe_2O_3	15.86
Lime, CaO	4.73
Magnesia, MgO	1.47
Potassium oxide, K_2O	2.15
Sodium oxide, Na_2O	0.27
Sulfur trioxide, SO_3	3.59
Phos. pentoxide, P_2O_5	0.05
Undetermined	0.67
	100.00

SILICA VALUE = 66.54
BASE: ACID RATIO 0.34
T_{250} Temperature = 2490°F

172

Fouling index.......... 0.09
Slagging index......... 0.34

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification
by KVB, Inc.

Test No. 1

Kind of sample reported to us	Multiclone Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-11-79
Date received	11-29-79

Analysis report no. 71-43296

Dry Basis

% Combustible.......... 30.08

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification
by KVB, Inc.

Test No. 2

Kind of sample reported to us	Multiclone Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-13-79
Date received	11-29-79

Analysis report no. 71-43299

Dry Basis

% Combustible.......... 30.68

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash	Test No. 3
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	------	
Date received	11-29-79	

Analysis report no. 71-43302

	Dry Basis
% Combustible..........	27.99

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	------
Date received	11-29-79

Test No. 4

Analysis report no. 71-43305

	Dry Basis
% Combustible..........	32.08

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test No. 5

Kind of sample reported to us	Fly Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-24-79
Date received	11-29-79

Analysis report no. 71-43308

Dry Basis

% Combustible.......... 28.77

Respectfully submitted,
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6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash	Test No. 6
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-24-79	
Date received	11-29-79	

Analysis report no. 71-43311

	Dry Basis
% Combustible..........	32.60

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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6176 Olson Memorial Highway
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December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash	Test No. 7
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-27-79	
Date received	11-29-79	

Analysis report no. 71-43314

	Dry Basis
% Combustible..........	23.75

Respectfully submitted,
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6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-26-79
Date received	11-29-79

Test No. 8

Analysis report no. 71-43317

Dry Basis

% Combustible.......... 33.56

Respectfully submitted,
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December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash	Test No. 9
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-27-79	
Date received	11-29-79	

Analysis report no. 71-43320

	Dry Basis
% Combustible..........	27.22

Respectfully submitted,
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December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-29-79
Date received	11-29-79

Test No. 10

Analysis report no. 71-43323

	Dry Basis
% Combustible..........	29.76

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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6176 Olson Memorial Highway
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December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Fly Ash	Test No. 11
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-30-79	
Date received	11-29-79	

Analysis report no. 71-43326

Dry Basis

% Combustible.......... 29.62

Respectfully submitted,
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Sample identification by KVB, Inc.

Kind of sample reported to us	Multiclone Ash	Test No. 12
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-6-79	
Date received	11-29-79	

Analysis report no. 71-43329

	Dry Basis
% Combustible..........	28.90

Respectfully submitted,
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A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification by KVB, Inc.

Kind of sample reported to us	Multiclone Ash	Test No. 13
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-7-79	
Date received	11-29-79	

Analysis report no. 71-43331

Dry Basis

% Combustible.......... 30.64

Respectfully submitted,
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A Research-Cottrell Co.
6176 Olson Memorial Hwy.
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us: Multiclone Ash — Test 14

Sample taken at: Test Site "K"

Sample taken by: KVB, Inc.

Date sampled: 11-7-79

Date received: 11-29-79

Analysis report no. 71-43332

	Dry Basis
% Combustible	29.72

Respectfully submitted,
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A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Multiclone Ash	Test No. 15
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-8-79	
Date received	11-29-79	

Analysis report no. 71-43337

	Dry Basis
% Combustible..........	26.49

Respectfully submitted,
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December 4, 1979

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Minneapolis, MN 55422

Sample identification by KVB, Inc.

Kind of sample reported to us	Multiclone Ash	Test No. 16
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-9-79	
Date received	11-29-79	

Analysis report no. 71-43340

Dry Basis

% Combustible.......... 26.46

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Multiclone Ash	Test #18
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-12-79	
Date received	11-29-79	

Analysis report no. 71-43344

	Dry Basis
% Ash....................	71.88
% Combustible...........	28.12
% Sulfur................	0.36

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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December 4, 1979

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 1
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-11-79	
Date received	11-29-79	

Analysis report no. 71-43295

	Dry Basis
% Combustible..........	27.63

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test No. 2

Kind of sample reported to us	Bottom Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-13-79
Date received	11-29-79

Analysis report no. 71-43298

	Dry Basis
% Combustible..........	23.93

Respectfully submitted,
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6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 3
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	------	
Date received	11-29-79	

Analysis report no. 71-43301

Dry Basis

% Combustible.......... 37.50

Respectfully submitted,
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6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us: Bottom Ash

Test No. 4

Sample taken at: Test Site "K"

Sample taken by: KVB, Inc.

Date sampled: ------

Date received: 11-29-79

Analysis report no. 71-43304

	Dry Basis
% Combustible..........	47.59

Respectfully submitted,
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Sample identification
by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 5
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-24-79	
Date received	11-29-79	

Analysis report no. 71-43307

Dry Basis

% Combustible.......... 69.07

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-24-79
Date received	11-29-79

Test No. 6

Analysis report no. 71-43310

	Dry Basis
% Combustible..........	60.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-29-79
Date received	11-29-79

Test No. 7

Analysis report no. 71-43313

	Dry Basis
% Combustible..........	37.85

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

RAHouser

R. A. HOUSER, Manager, Midwest Division

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.
Charter Member

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F-464

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

SINCE 1908

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SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 8
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-26-79	
Date received	11-29-79	

Analysis report no. 71-43316

	Dry Basis
% Combustible..........	39.52

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us Bottom Ash

Test No. 9

Sample taken at Test Site "K"

Sample taken by KVB, Inc.

Date sampled 10-27-79

Date received 11-29-79

Analysis report no. 71-43319

Dry Basis

% Combustible.......... 75.48

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 10
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	10-29-79	
Date received	11-29-79	

Analysis report no. 71-43322

Dry Basis

% Combustible.......... 36.57

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Test No. 11

Kind of sample reported to us	Bottom Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	10-30-79
Date received	11-29-79

Analysis report no. 71-43325

	Dry Basis
% Combustible..........	46.78

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

SINCE 1908

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash
Sample taken at	Test Site "K"
Sample taken by	KVB, Inc.
Date sampled	11-6-79
Date received	11-29-79

Test No. 12

Analysis report no. 71-43328

Dry Basis

% Combustible.......... 27.02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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SINCE 1908

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 13 & 14
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-7-79	
Date received	11-29-79	

Analysis report no. 71-43335

	Dry Basis
% Combustible..........	34.78

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
617. Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us Bottom Ash

Test No. 15

Sample taken at Test Site "K"

Sample taken by KVB, Inc.

Date sampled 11-8-79

Date received 11-29-79

Analysis report no. 71-43336

Dry Basis

% Combustible.......... 39.84

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

Charter Member

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SINCE 1908

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 16
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-9-79	
Date received	11-29-79	

Analysis report no. 71-43339

	Dry Basis
% Combustible..........	21.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

December 4, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test No. 17
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-10-79	
Date received	11-29-79	

Analysis report no. 71-43341

	Dry Basis
% Combustible..........	72.72

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

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SINCE 1908

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Hwy
Minneapolis, MN 55422

December 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Bottom Ash	Test #18
Sample taken at	Test Site "K"	
Sample taken by	KVB, Inc.	
Date sampled	11-12-79	
Date received	11-29-79	

Analysis report no. 71-43343

	Dry Basis
% Ash....................	70.50
% Combustible...........	29.50
% Sulfur................	0.27

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

Charter Member

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COMBUSTIBLES DATA SHEET

SITE K

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combus-tibles
26	TEST#1 Site K BLR OUT	10.2359	11.3190	1.0829	10.9702	0.3488	32.2
		10.2362	11.3191		10.9703		
		—	—		—		
	AVG.	10.2361	11.3190		10.9702		
24	TEST#2 Site K BLR OUT	10.1174	10.3571	0.2398	10.2708	0.0863	36.0
		10.1175	10.3574		10.2710		
		—	—		—		
	AVG.	10.1174	10.3572		10.2709		
21	TEST#4 Site K BLR OUT	9.4800	10.1280	0.6481	9.8904	0.2378	36.7
		9.4802	10.1284		9.8904		
		—	—		—		
	AVG.	9.4801	10.1282		9.8904		
30	TEST#5 Site K BLR OUT	9.6545	10.2922	0.6379	10.0319	0.2604	40.8
		9.6544	10.2925		10.0320		
		—	—		—		
	AVG.	9.6544	10.2923		10.0319		
42	TEST#6 Site K BLR OUT	10.8687	10.9183	0.5497	10.7568	0.1616	29.4
		10.3688	10.9185		10.7568		
		—	—		—		
	AVG.	10.3687	10.9184		10.7568		
22	TEST#7 Site K BLR OUT	9.7271	10.5828	0.8559	10.3516	0.2314	27.0
		9.7271	10.5832		10.3517		
		—	—		—		
	AVG.	9.7271	10.5830		10.3516		
20	TEST#8 Site K BLR OUT	8.8414	9.4514	0.6160	9.2719	0.1795	29.4
		8.8415	9.4515		9.2719		
		—	—		—		
	AVG.	8.8414	9.4514		9.2719		
	AVG.						
	AVG.						
	AVG.						
	AVG.						

COMBUSTIBLES DATA SHEET

SITE K

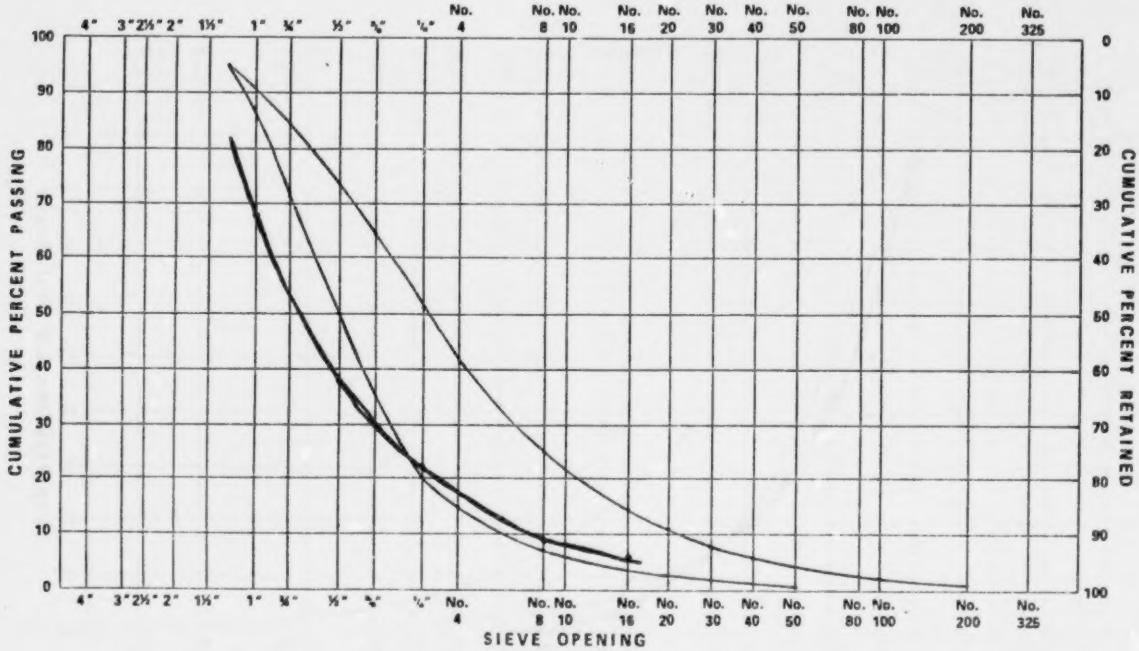
Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combus-tibles
30	TEST # 9	9.6541	9.7482	.0942	9.7257	.0227	24.0
		9.6541	9.7484		9.7256		
	AVG.	9.6541	9.7483		9.7256		
28	TEST # 10	10.0570	10.5541	0.4973	10.3842	.1700	34.2
		10.0568	10.5543		10.3843		
	AVG.	10.0569	10.5542		10.3842		
22	TEST # 11	9.7269	10.5472	0.8204	10.2937	0.2538	30.9
		9.7270	10.5474		10.2933		
	AVG.	9.7269	10.5473		10.2935		
24	TEST # 12	10.1169	10.7821	0.6652	10.5798	0.2024	30.4
		10.1170	10.7822		10.5797		
	AVG.	10.1169	10.7821		10.5797		
42	TEST # 13	10.3682	11.6316	1.2634	11.1824	0.4490	35.5
		10.3682	11.6317		11.1827		
	AVG.	10.3682	11.6316		11.1826		
39	TEST # 14	9.9989	11.6937	1.6951	11.0986	0.5959	35.1
		9.9987	11.6941		11.0974		
	AVG.	9.9988	11.6939		11.0980		
26	TEST # 15	10.2357	11.1114	0.8754	10.8239	0.2875	32.8
		10.2355	11.1106		10.8231		
	AVG.	10.2356	11.1110		10.8235		
21	TEST # 16	9.4794	10.8628	1.3833	10.3392	0.5236	37.8
		9.4794	10.8627		10.3389		
	AVG.	9.4794	10.8627		10.3391		
20	TEST # 17	8.8412	9.1144	0.2733	9.0279	0.0866	31.6
		8.8411	9.1144		9.0278		
	AVG.	8.8411	9.1144		9.0278		
	AVG.						
	AVG.						

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 1
DATE SAMPLE TAKEN 10-11-79
TEST SITE K
TEST PERFORMED BY JoB
SAMPLE IDENTIFICATION Alabama - washed

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.2	1539.4	1430.2	32.1	4458.5	100.0	5
1"		1448.0	1338.8	30.0	3028.3	67.9	5
1/2"		829.4	720.2	16.2	1689.5	37.9	5
1/4"		658.6	549.4	12.3	969.3	21.7	5
#8		289.0	179.8	4.0	419.9	9.4	5
#16		349.3	240.1	5.4	240.1	5.4	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 2

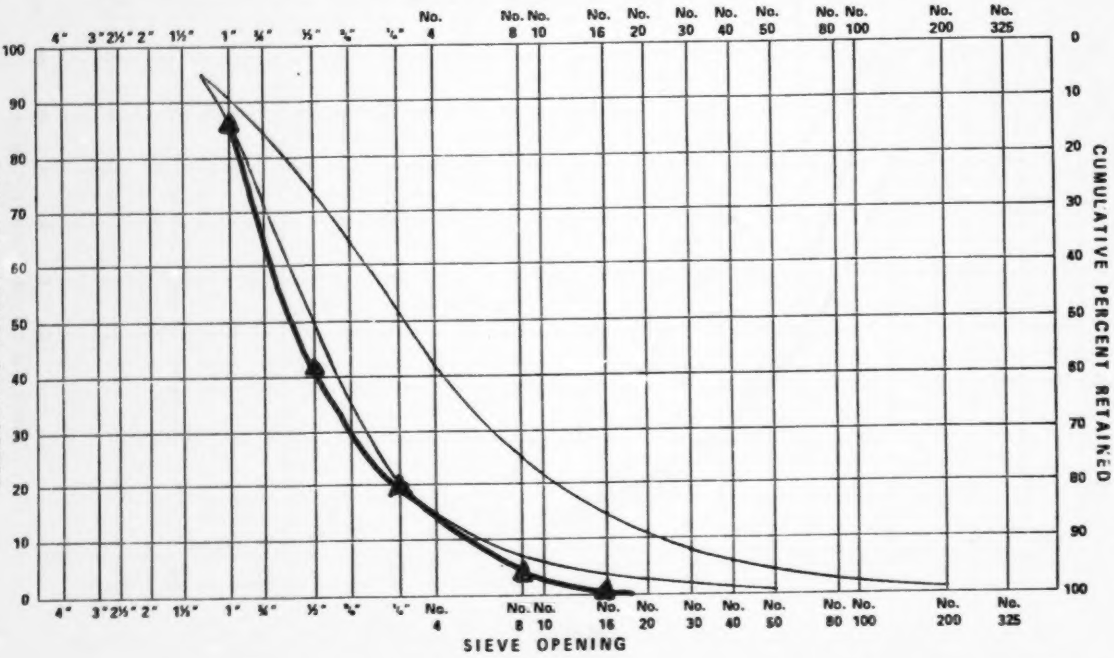
DATE SAMPLE TAKEN 10/13/79

TEST SITE K

TEST PERFORMED BY Stu Smith

SAMPLE IDENTIFICATION Alabama - Washed

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.2	885.2	776.3	14.1	5511.5	100.0	5
1"	198.9	2639.1	2440.2	44.3	4735.2	85.9	"
½"	109.2	1356.1	1246.9	22.6	2295.0	41.6	"
¼"	110.1	947.1	837.0	15.2	1048.1	19.0	"
#8	88.8	278.7	189.9	3.4	211.1	3.8	"
#16	88.8	110.0	21.2	0.4	21.2	0.4	"

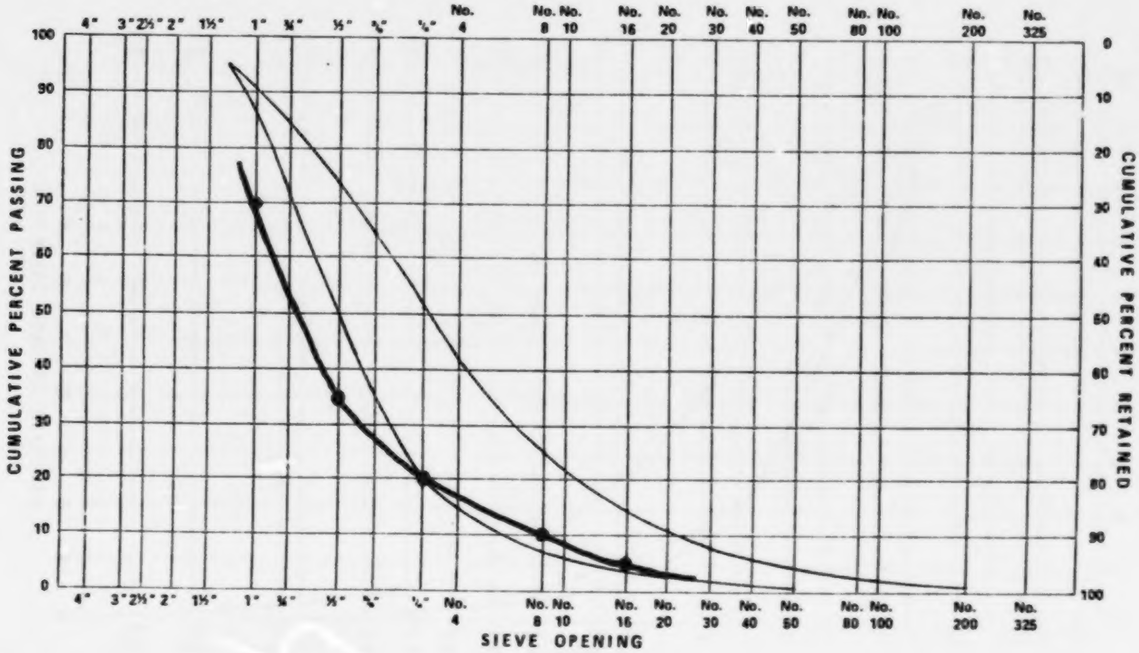


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 3
DATE SAMPLE TAKEN 10/15/79
TEST SITE K
TEST PERFORMED BY Stu Smith
SAMPLE IDENTIFICATION Brilliant-Alabama Washed

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.2	1483.5	1374.3	29.9	4589.4	99.9	5
1"	110.1	1697.1	1587.0	34.6	3215.1	70.0	"
½"	88.8	788.1	699.3	15.2	1628.1	35.4	"
¼"	110.1	566.5	456.4	9.9	928.8	20.2	"
#8	109.2	314.4	205.2	4.5	472.4	10.3	"
#16	88.8	356.0	267.2	5.8	267.2	5.8	"



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 4

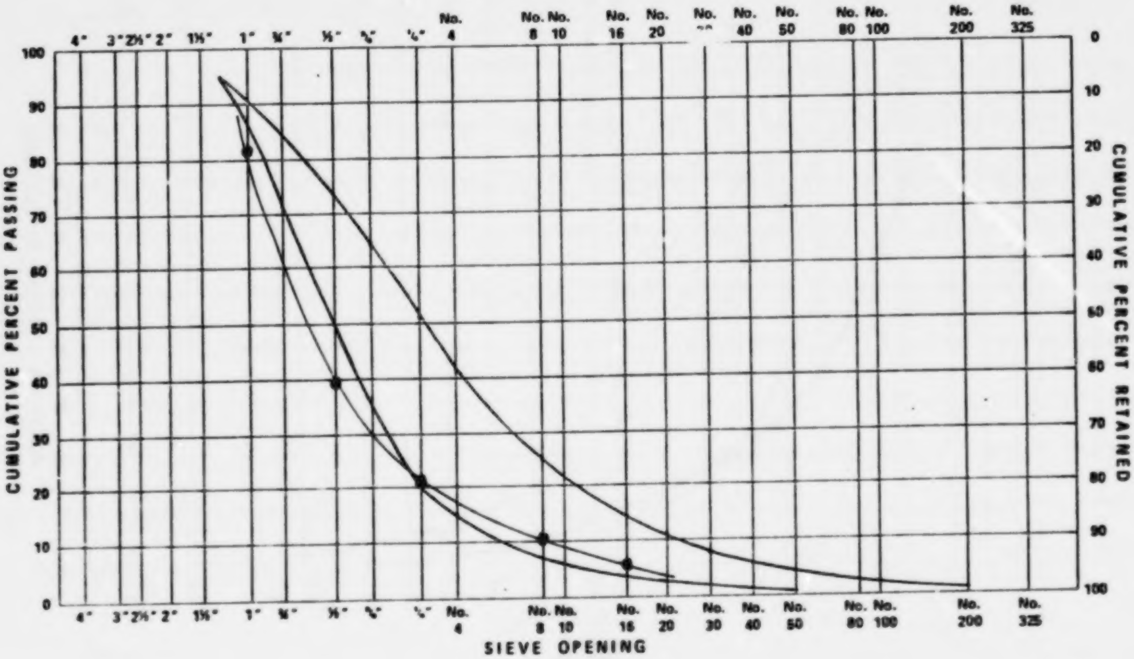
DATE SAMPLE TAKEN 10/16/79

TEST SITE K

TEST PERFORMED BY Stu Smith

SAMPLE IDENTIFICATION Brilliant - Alabama Washed

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	817.5	728.7	18.1	4017.7	100.0	5
1"	109.2	1800.0	1690.8	42.1	3289.0	81.9	"
½"	110.1	843.6	733.5	18.3	1598.2	39.8	"
¼"	110.1	565.1	455.0	11.3	864.7	21.5	"
#8	88.8	257.1	168.3	4.2	409.7	10.2	"
#16	109.2	350.6	241.4	6.0	241.4	6.0	"



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 5

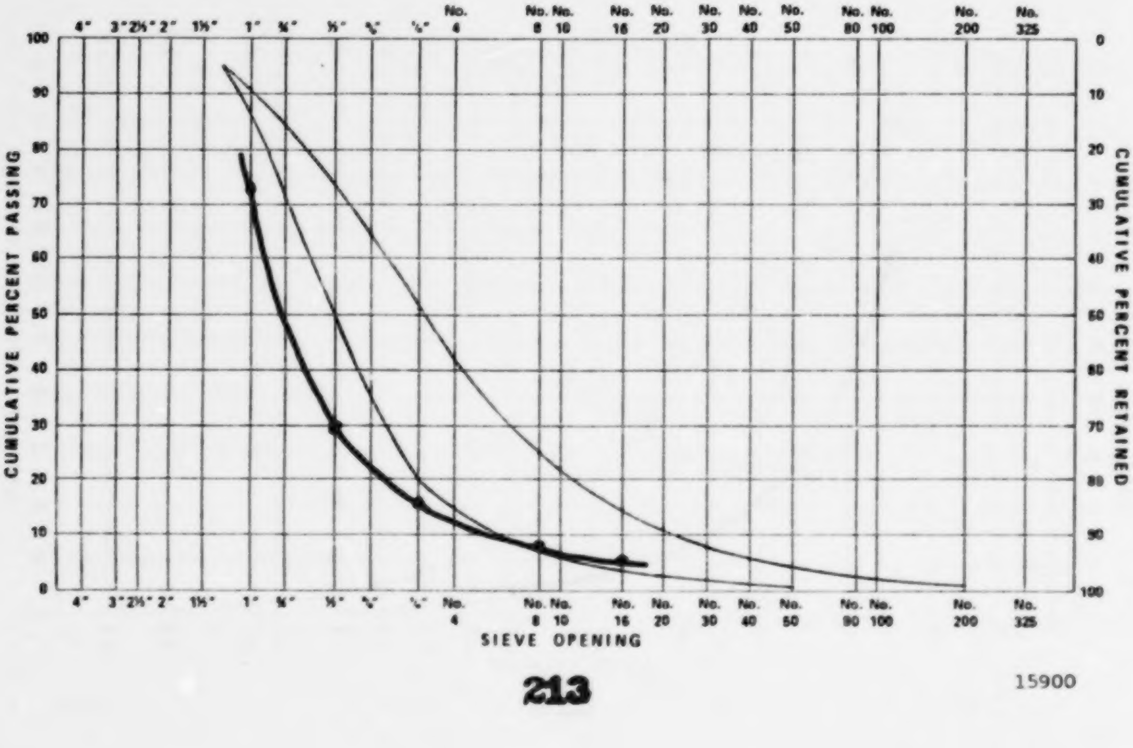
DATE SAMPLE TAKEN 10/24/79

TEST SITE K

TEST PERFORMED BY Stan Smith

SAMPLE IDENTIFICATION Billiant - Alabama Washed (not crushed)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	1023.4	934.6	26.6	3516.3	100.1	5
1"	110.1	1646.5	1536.4	43.7	2581.7	73.5	"
½"	109.2	589.3	480.1	13.7	1045.3	29.8	"
¼"	88.8	359.6	270.8	7.7	565.2	16.1	"
#8	110.1	224.9	114.8	3.3	294.4	8.4	"
#16	109.2	288.8	179.6	5.1	179.6	5.1	"

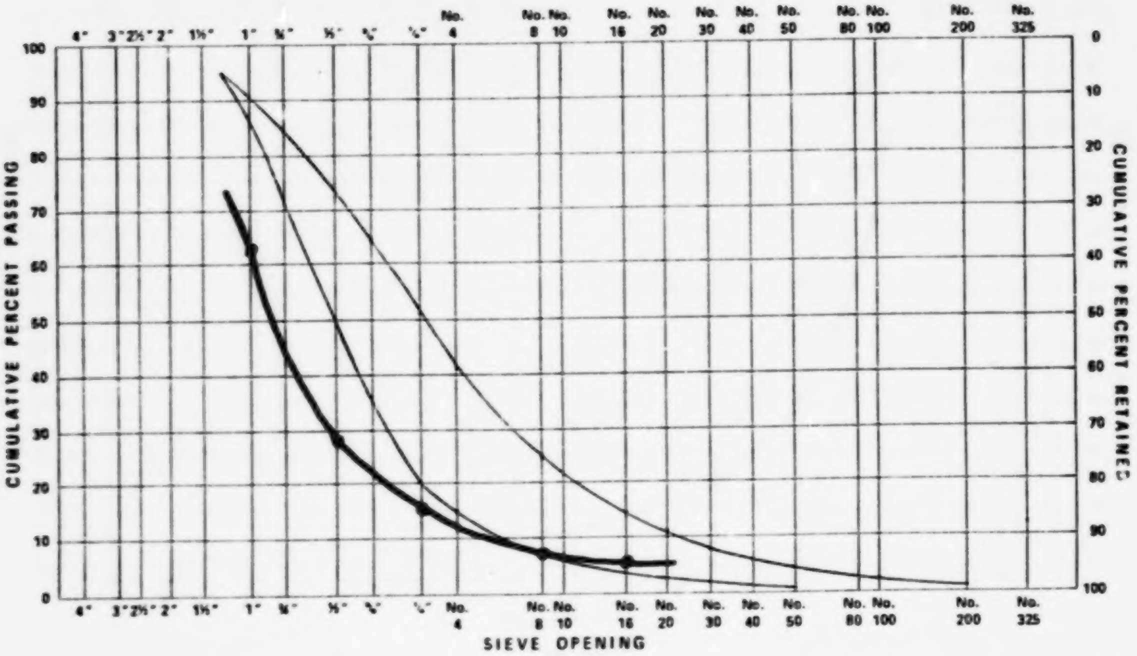


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 6
DATE SAMPLE TAKEN 10/24
TEST SITE K
TEST PERFORMED BY Stu Smith
SAMPLE IDENTIFICATION Brilliant - Alabama Washed (not crushed)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	1182.6	1093.8	37.5	2920.2	100.1	5
1"	110.1	1114.9	1004.8	34.4	1826.4	62.6	"
1/2"	109.2	476.5	367.3	12.6	821.6	28.2	"
1/4"	110.1	319.9	209.8	7.2	454.3	15.6	"
#8	109.2	187.5	78.3	2.7	244.5	8.4	"
#16	88.8	255.0	166.2	5.7	166.2	5.7	"



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 7

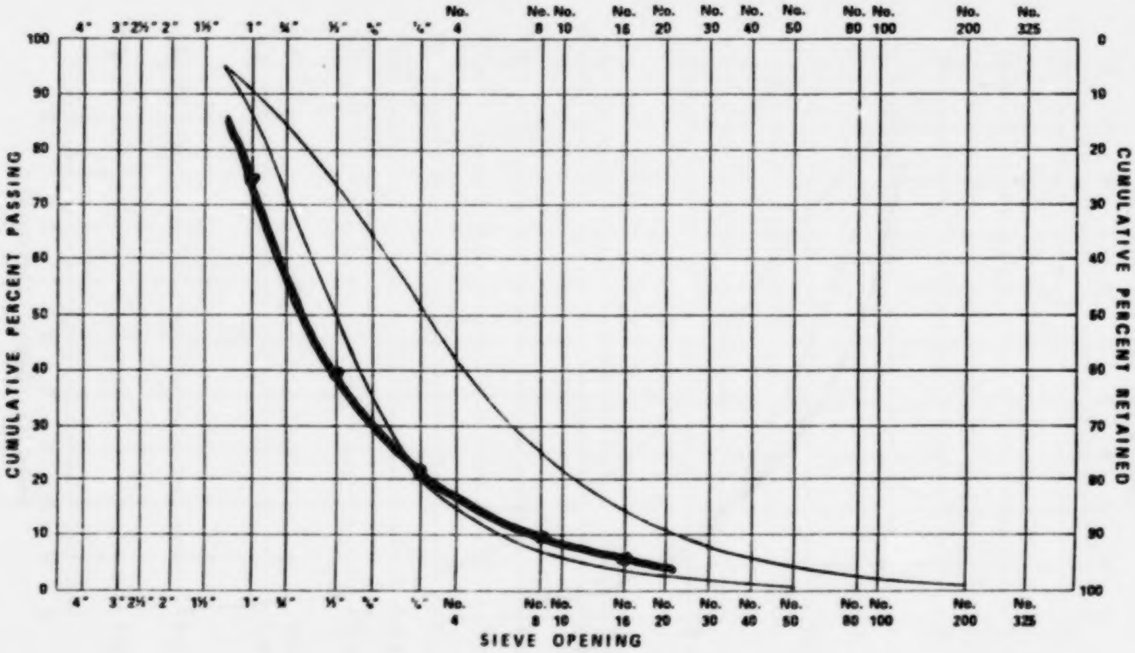
DATE SAMPLE TAKEN 10/25

TEST SITE K

TEST PERFORMED BY Stu Smith

SAMPLE IDENTIFICATION Brilliant - Alabama Washed (not crushed)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	1016.6	927.8	24.7	3761.4	100.0	5
1"	110.1	1465.8	1355.7	36.0	2833.6	75.3	"
½"	109.2	781.5	672.3	17.9	1477.9	39.3	"
¼"	88.8	530.5	441.7	11.7	805.6	21.4	"
#8	110.1	251.2	141.1	3.8	363.9	9.7	"
#16	109.2	332.0	222.8	5.9	222.8	5.9	"

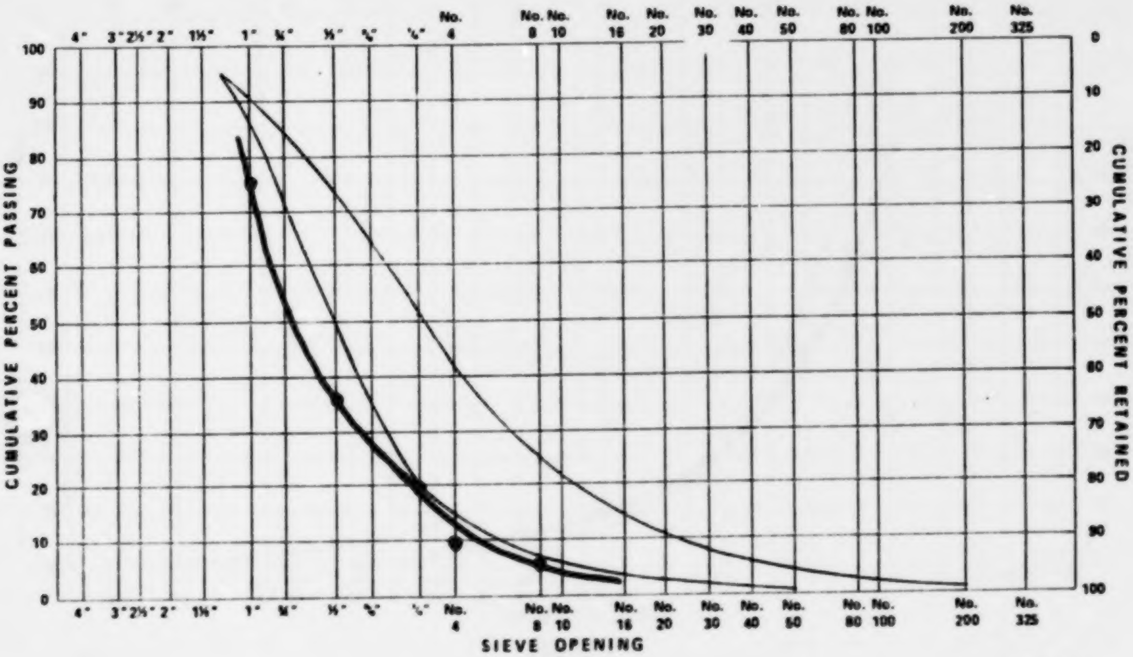


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 8
DATE SAMPLE TAKEN 10/27/79
TEST SITE K
TEST PERFORMED BY Stu Smith
SAMPLE IDENTIFICATION Brilliant - Alabama Washed (not crushed)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	1020.9	932.1	24.4	3820.2	99.9	5
1"	110.1	1585.8	1475.7	38.6	2888.1	75.5	"
1/2"	109.2	783.4	674.2	17.6	1412.4	36.9	"
1/4"	88.8	462.6	373.8	9.8	738.2	19.3	"
#8	109.2	250.8	141.6	3.7	364.4	9.5	"
#16	110.1	332.9	222.8	5.8	222.8	5.8	"



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 9

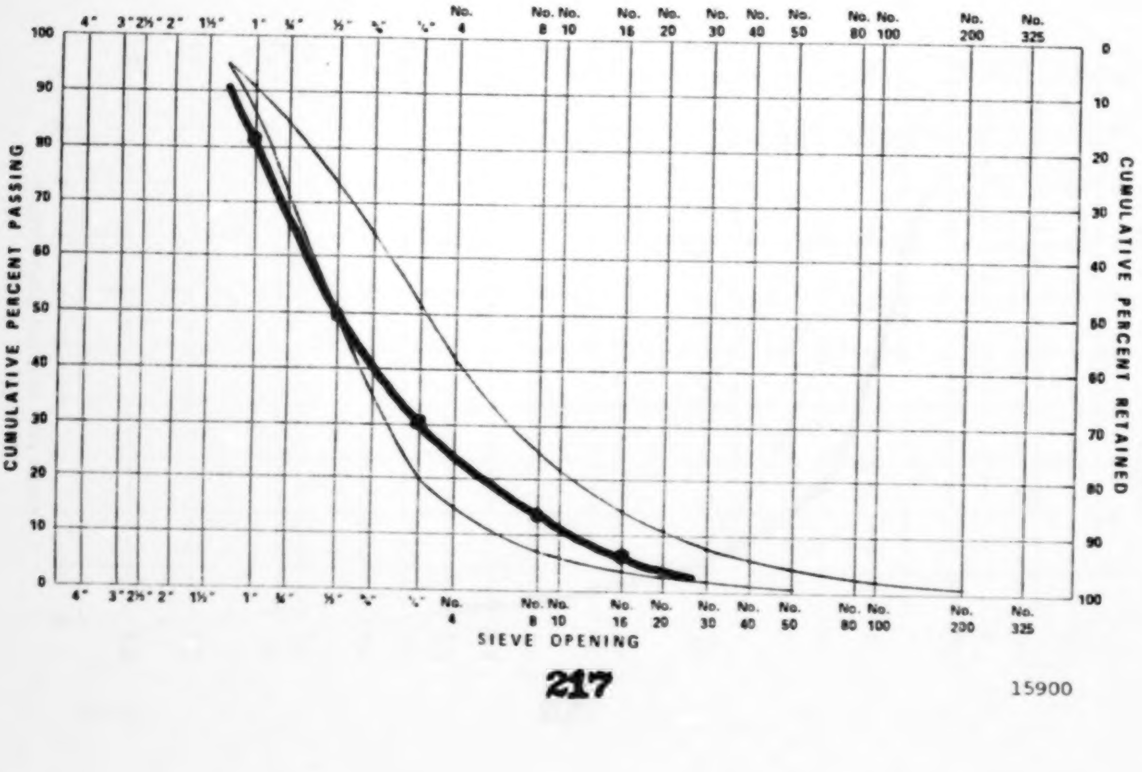
DATE SAMPLE TAKEN 10/27/79

TEST SITE K

TEST PERFORMED BY Stu Smith

SAMPLE IDENTIFICATION Brilliant - Alabama Washed (not crushed)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	705.0	616.2	18.3	3372.1	99.9	5
1"	109.2	1181.5	1072.3	31.8	2755.9	81.6	"
½"	110.1	748.7	638.6	18.9	1683.6	49.8	"
¼"	110.1	700.5	590.4	17.5	1045.0	30.9	"
#8	88.8	285.7	196.9	5.8	454.6	13.4	"
#16	109.2	366.9	257.7	7.6	257.7	7.6	"



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 10

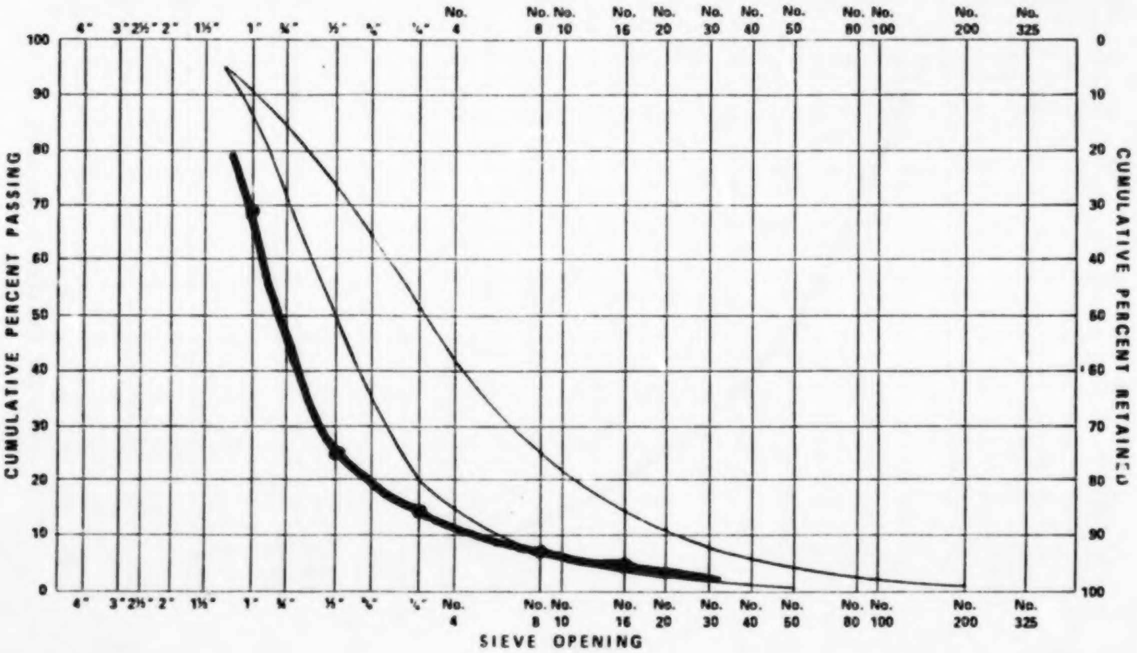
DATE SAMPLE TAKEN 10/29/79

TEST SITE A

TEST PERFORMED BY Stu Smith

SAMPLE IDENTIFICATION Brilliant - Alabama Washed (not crushed)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	1198.7	1109.9	31.2	3556.6	100.1	5
1"	177.6	1737.6	1560.0	43.9	2446.7	68.9	"
½"	88.8	461.2	372.4	10.5	886.7	25.0	"
¼"	88.8	316.4	227.6	6.4	514.3	14.5	"
#8	88.8	199.2	110.4	3.1	286.7	8.1	"
#16	88.8	265.1	176.3	5.0	176.3	5.0	"

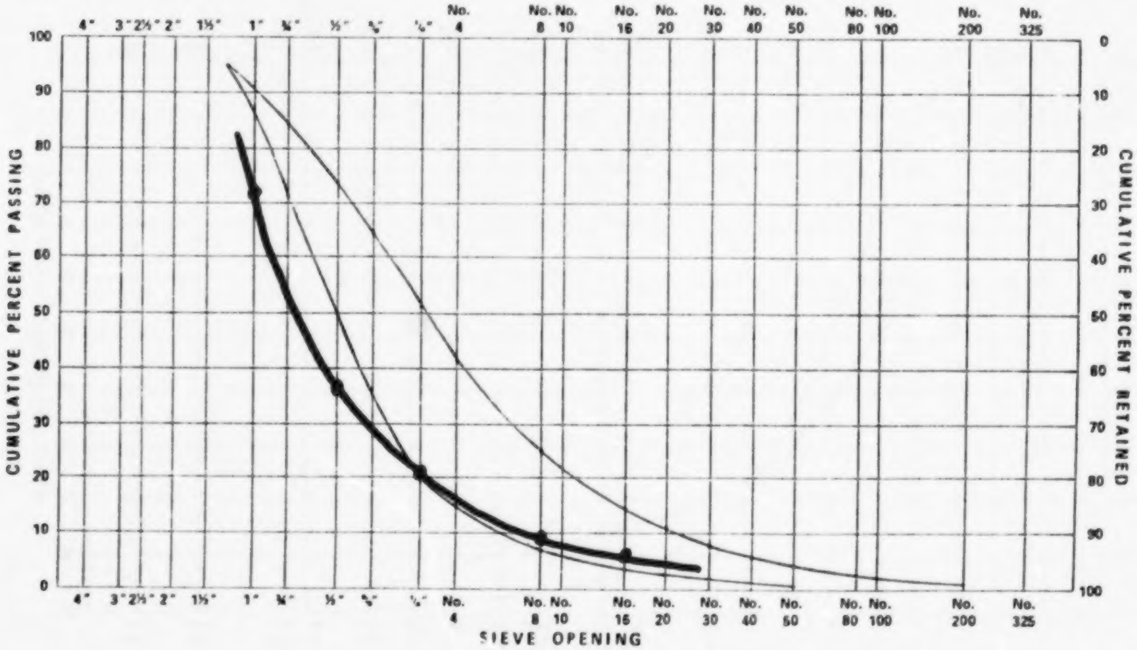


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 11
DATE SAMPLE TAKEN 10/30/79
TEST SITE K
TEST PERFORMED BY Stu. Sm.th
SAMPLE IDENTIFICATION Brilliant - Alabama Washed (not crushed)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	88.8	1258.4	1169.6	27.6	4236.4	100.0	5
1"	177.6	1680.6	1503.0	35.5	30668	72.4	"
½"	88.8	766.0	677.2	16.0	1563.8	36.9	"
¼"	88.8	566.6	477.8	11.3	886.6	20.9	"
#8	88.8	246.6	157.8	3.7	408.8	9.6	"
#16	88.8	339.8	251.0	5.9	251.0	5.9	"



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 12

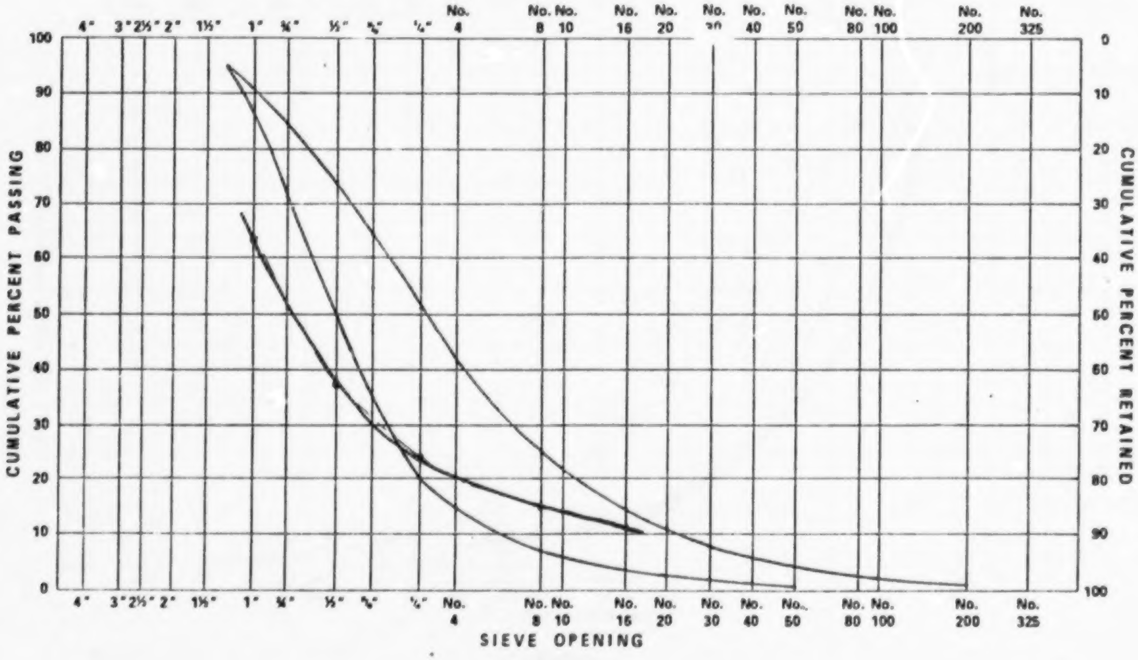
DATE SAMPLE TAKEN 11-6-79

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Unwashed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.4	729.5 1750.0	2258.7	36.6	6173.6	100.0	5
1"		1744.2	1634.8	26.5	3914.9	63.4	5
½"		961.1	851.7	13.8	2280.1	36.9	5
¼"		618.2	508.8	8.2	14284	23.1	5
#8		344.4	235.0	3.8	919.6	14.9	5
#16		794.0	684.6	11.1	684.6	11.1	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 13

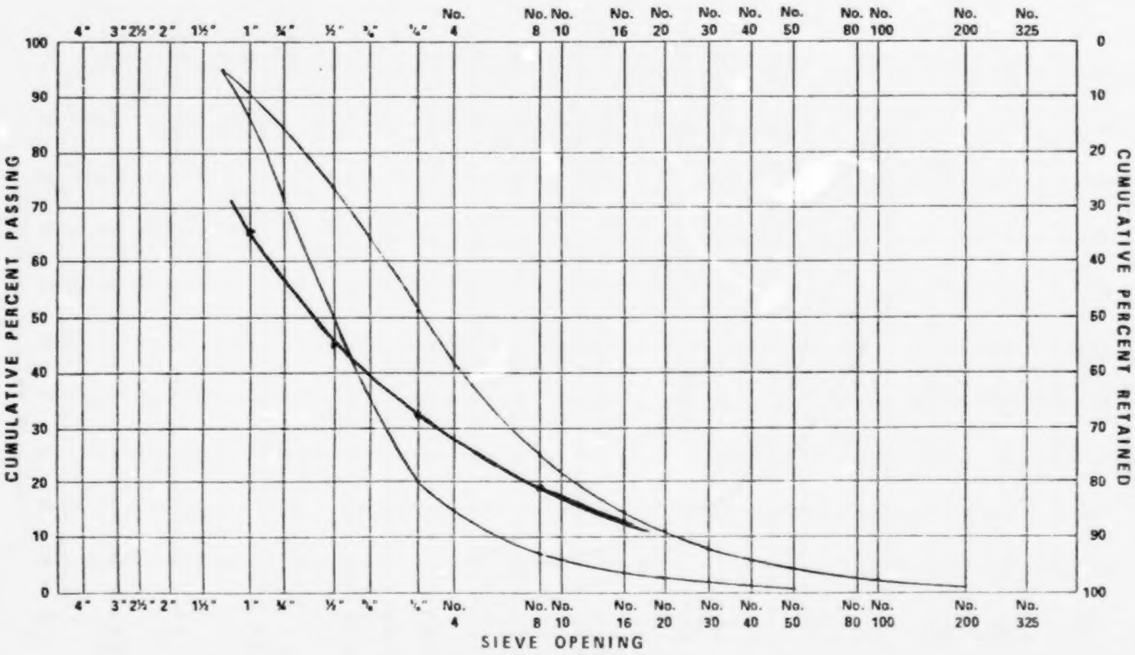
DATE SAMPLE TAKEN 11-7-79

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION UNWASHED AH.

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.5	609.3 1696.4	2086.7	34.6	6037.4	100.0	5
1"	↓	1303.7	1194.2	19.8	3950.7	65.4	5
½"		931.7	822.2	13.6	2756.5	45.6	5
¼"		903.2	793.7	13.1	1934.3	32.0	5
#8		496.4	386.9	6.4	1140.6	18.9	5
#16		863.2	753.7	12.5	753.7	12.5	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 14

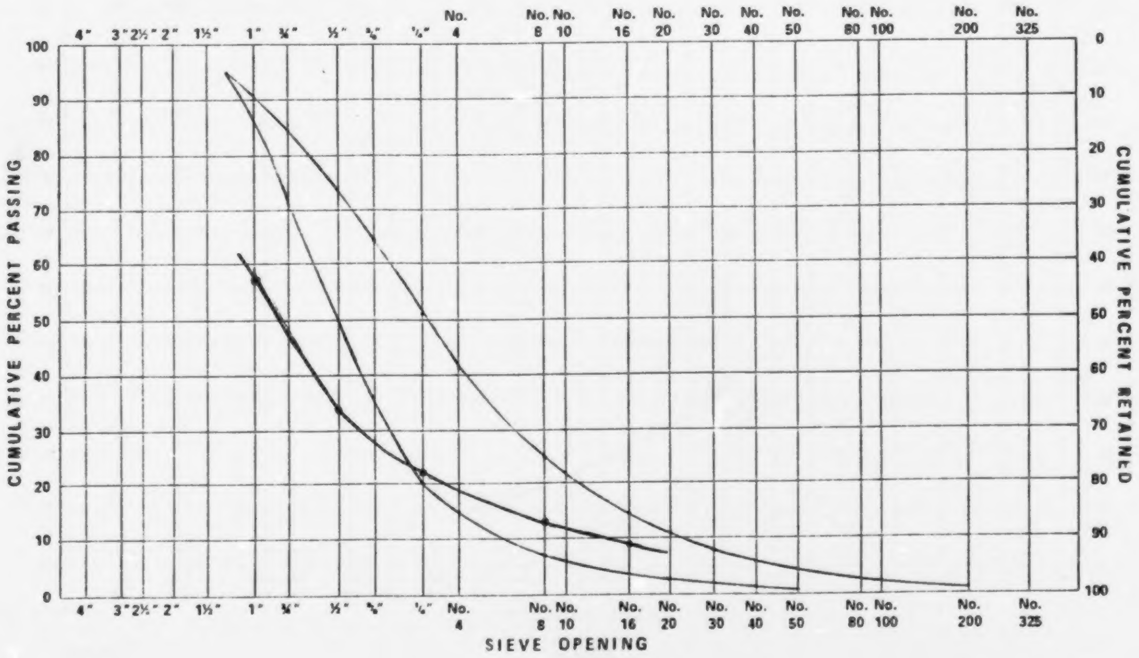
DATE SAMPLE TAKEN 11-8-79

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION UNWASHED COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.4	1068.7 1971.3	2821.2	42.9	6581.6	100.0	5
1"	↓	1614.5	1505.1	22.9	3760.4	57.1	5
$\frac{1}{2}$"		932.4	823.0	12.5	2255.3	34.2	5
$\frac{1}{4}$"		671.4	562.0	8.5	1432.3	21.7	5
#8		386.1	276.7	4.2	870.3	13.2	5
#16		703.0	593.6	9.0	593.6	9.0	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 15

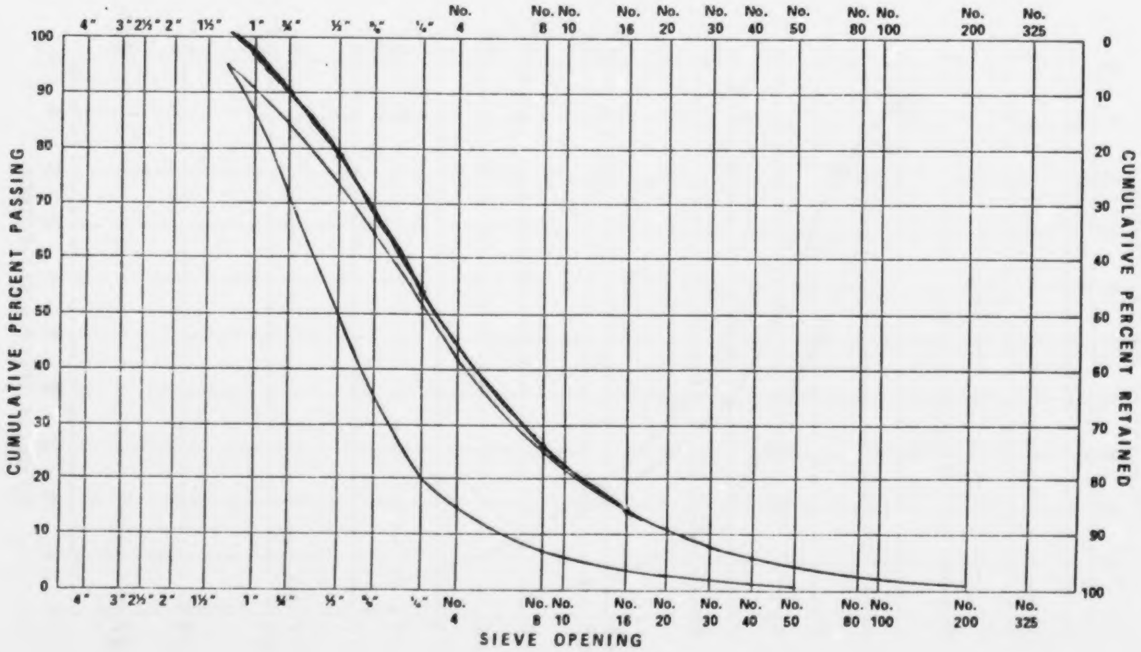
DATE SAMPLE TAKEN 11-8-79

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION CRUSHED COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.4	254.4	145.0	3.2	4495.0	100.0	5
1"		923.5	814.1	18.1	4350.0	96.7	5
½"		1229.3	1119.9	24.9	3535.9	78.6	5
¼"		1364.5	1255.1	27.9	2416.0	53.7	5
#8		647.9	538.5	12.0	1160.9	25.8	5
#16		731.8	622.4	13.8	622.4	13.8	5

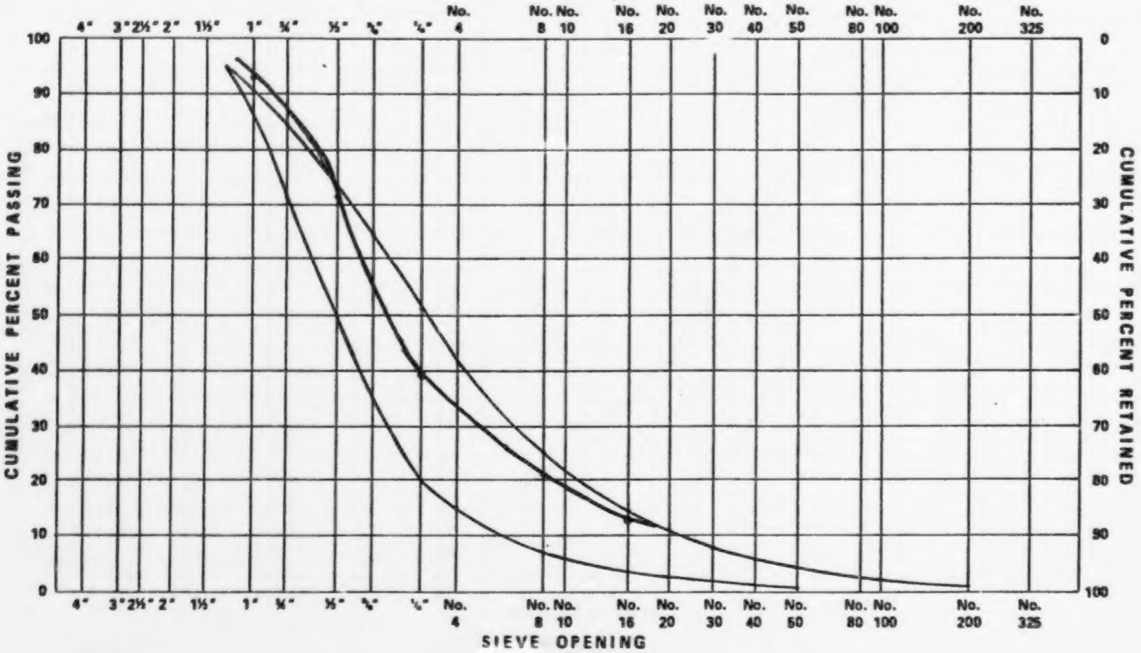


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 16
DATE SAMPLE TAKEN 11-9-79
TEST SITE K
TEST PERFORMED BY JOB
SAMPLE IDENTIFICATION CRUSHED COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.5	348.2	238.7	6.3	3813.5	100.0	5
1"	↓	931.1	821.6	21.5	3574.8	93.7	5
½"		1360.1	1250.6	32.8	2753.2	72.2	5
¼"		822.9	713.4	18.7	1502.6	39.4	5
#8		385.6	276.1	7.2	789.2	20.7	5
#16		622.6	513.1	13.5	513.1	13.5	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 17

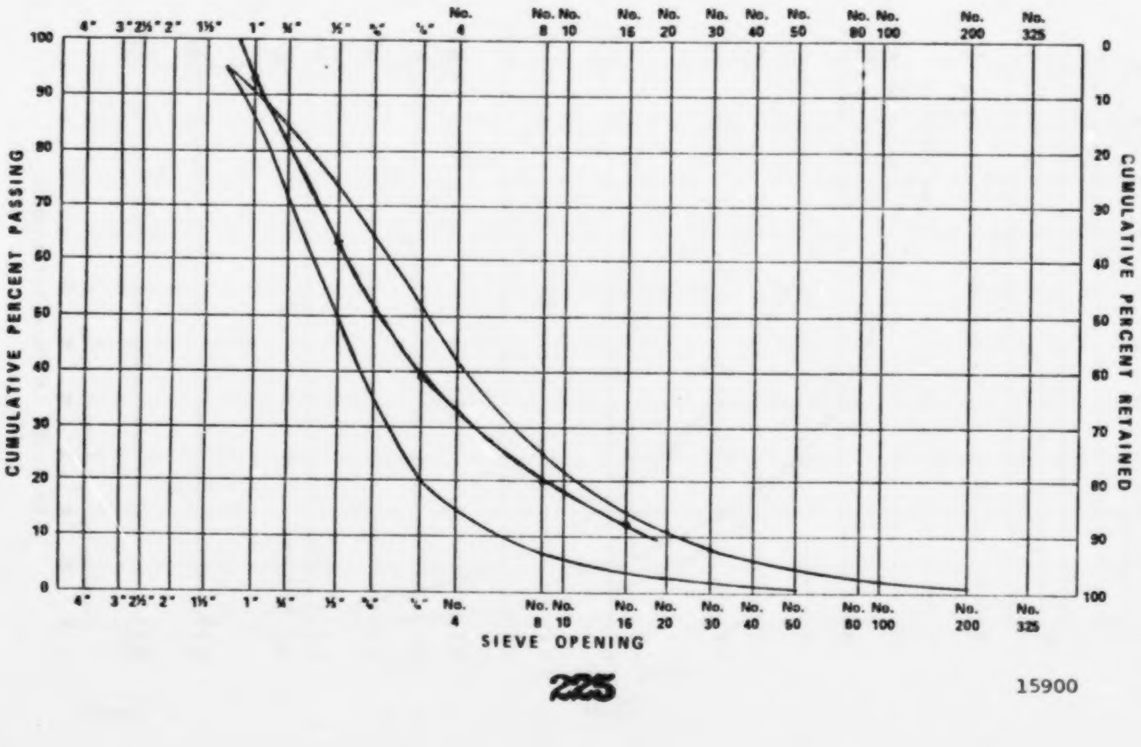
DATE SAMPLE TAKEN 11-10-79

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION CRUSHED COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.2	498.9	389.7	6.6	5910.2	100.0	5
1"	↓	1878.5	1769.3	29.9	5520.5	93.2	5
1/2"		1524.3	1415.1	23.9	3751.2	63.3	5
1/4"		1258.3	1149.1	19.4	2336.1	39.4	5
#8		560.5	451.3	7.6	1187.0	20.0	5
#16		844.9	735.7	12.4	735.7	12.4	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 18

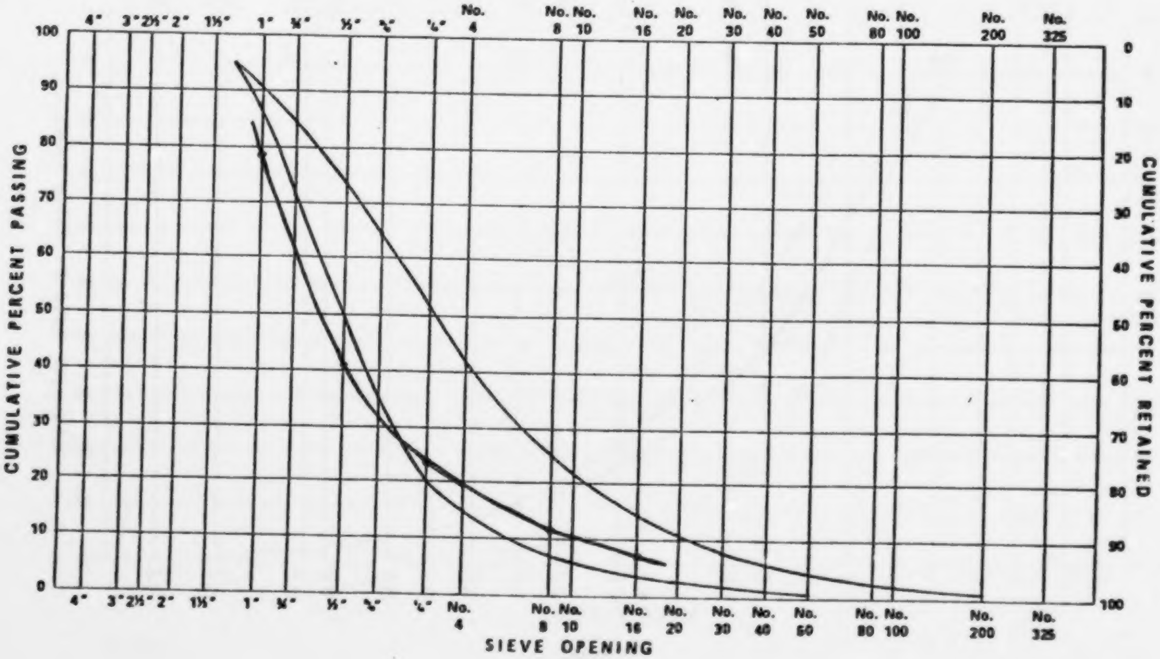
DATE SAMPLE TAKEN 11-12-79

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION WASHED COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.2	1471.8	1362.6	21.5	6349.6	100.0	5
1"	↓	1126.9 1507.3	2415.8	38.0	4987.0	78.4	5
½"		1202.2	1093.0	17.2	2571.2	40.4	5
¼"		891.9	782.7	12.3	1478.2	23.2	5
#8		384.0	274.8	4.3	695.5	10.9	5
#16		529.9	420.7	6.6	420.7	6.6	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

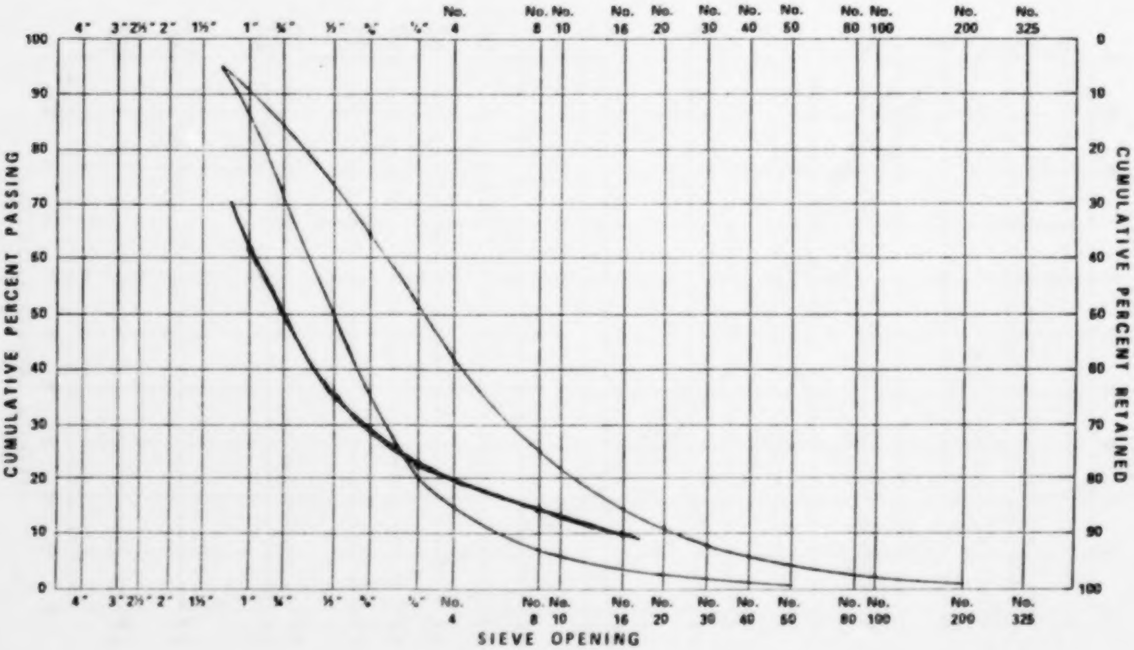
DATE SAMPLE TAKEN —

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION UNWASHED COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.5	448.5 1927.8	2157.3	39.0	5532.0	100.0	5
1"		1519.6	1410.1	25.5	3374.7	61.0	5
½"		817.8	708.3	12.8	1964.6	35.5	5
¼"		591.2	481.7	8.7	1256.3	22.7	5
#8		346.4	230.9	4.2	774.6	14.0	5
#16		653.2	543.7	9.8	543.7	9.8	5



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

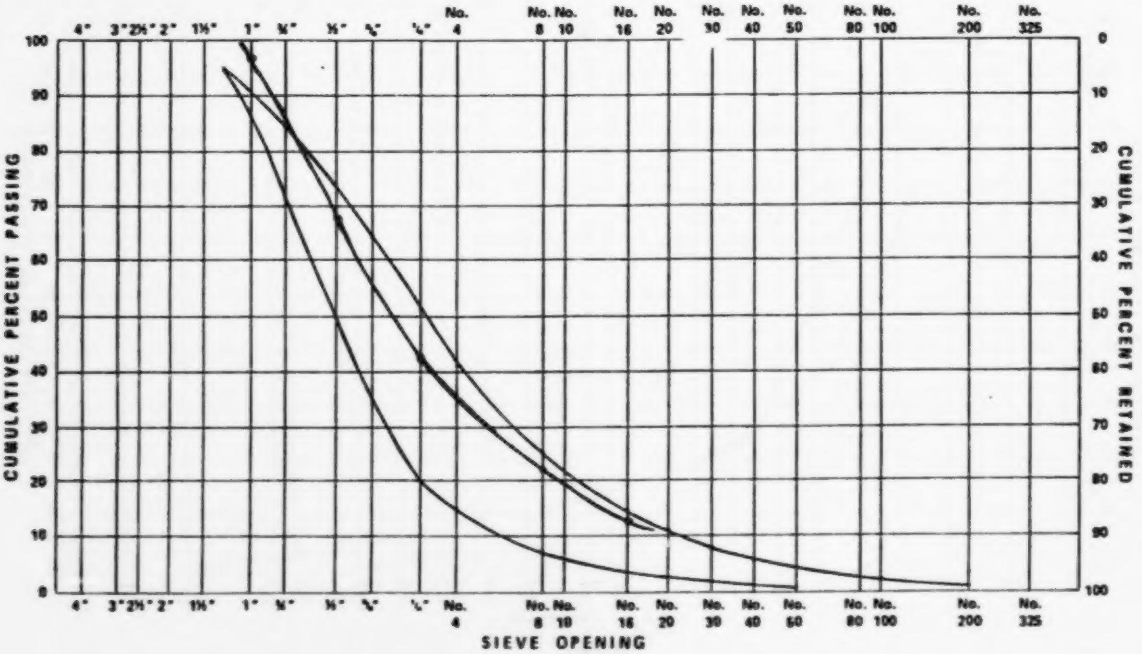
DATE SAMPLE TAKEN —

TEST SITE K

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION CRUSHED COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.1	290.9	181.8	3.7	4941.7	100.0	5
1"	↓	1528.0	1418.9	28.7	4759.9	96.3	5
½"		1353.5	1244.4	25.2	3341.0	67.6	5
¼"		1136.9	1027.8	20.8	2096.6	42.4	5
#8		525.9	416.8	8.4	1068.8	21.6	5
#16		761.1	652.0	13.2	652.0	13.2	5


CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING
4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
0 10 20 30 40 50 60 70 80 90 100